AMD Server/Workstation Solution Provider Roadmap

Q206 Update

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Overview

- The AMD Advantage
- AMD64 Ecosystem Update
- Server/Workstation Brand and Processor Positioning
- Server/Workstation Technologies
- Dual-Core AMD Opteron™ Processor Architecture
- Eliminating Architectural Bottlenecks
- Power Comparison and PowerNow!™ Technology with OPM
- Near-Term Product Outlook
- Processor Roadmap and Features
- Distribution Product Offering - PIB and WOF
- Benchmarks
- AMD Server Solutions Programs

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The AMD Advantage

Driving Innovation into the x86 Processor

Enhance performance while offering the flexibility to support both 32- and 64-bit applications

64-bit and Multi-Core

Can help reduce server power consumption and heat output

Performance-Per-Watt

Direct Connect Architecture

Eliminate the 20-year old traditional front-side bus, increasing system efficiency and scalability

AMD Virtualization

Can increase utilization by enabling the running of separate, secure operating environments

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AMD64 Software Ecosystem Update

- Thousands of x86-based applications run today on AMD64 processors
- Over 300 ISVs and open source software organizations are actively promoting AMD64 compatibility
- AMD64 processors are driving major O/S ecosystems
  - Microsoft, Novell, Red Hat, Sun
- AMD64 technology is now a key component in software roadmaps
  - Windows® Vista
  - Novell SUSE Linux 10
  - Red Hat Enterprise Linux 5
  - Virtualization software (VMware, Xen, Microsoft)

To Learn More Visit http://www.amdcompare.com

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Server/Workstation Brand Positioning

PERFORMANCE 4-WAY AND 8-WAY

AMD Opteron™ 800 Series

- Designed for 4-way and 8-way solutions
- Only native x86 dual-core solution for 4-way / 8-way computing
- 940 Pin Package

PERFORMANCE 2-WAY

AMD Opteron™ 200 Series

- Designed for 2-way Server / Workstation solutions
- Only native x86 dual-core solution for 2-way computing
- 940 Pin Package

PERFORMANCE 1-WAY

AMD Opteron™ 100 Series

- Designed for 1-way Server / Workstation solutions
- Only native x86 dual-core solution for 1-way computing
- 939 Pin Package

AMD Opteron™ Processors for Servers and Workstations

- Direct Connect Architecture eliminates the bottlenecks inherent in traditional front-side bus architectures by directly connecting CPU's, memory and I/O for reduced latency and optimized memory performance.
- Dual-Core AMD Opteron™ processors offer improved system efficiency and application performance
- AMD PowerNow!™ technology with Optimized Power Management (OPM) can decrease overall system power consumption without compromising system performance.

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AMD Opteron™ Processor Positioning

- The standard AMD Opteron processor offers the best performance and price/performance
  - Best 1-way, 2-way, 4-way & 8-way architecture for x86 computing
  - Best 32- and 64-bit x86 solution, delivering the best price/performance in the industry

- AMD Opteron processor HE is the highest performance-per-watt processor
  - Introduced at frequencies "N-1" and below (relative to 95W Standard Power AMD Opteron processors)
  - Industry-leading performance-per-watt

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Server/Workstation Technologies

FEATURE	FUNCTION	END USER BENEFIT
Direct Connect Architecture	Eliminates the real challenges and bottlenecks of system architectures through the use of separate, dedicated high-speed links • between the processor and main memory • between the processor and I/O • between the central CPU and other processors • between CPU cores within the same processor	Provides optimized memory performance, balanced throughput, expandable I/O, and more linear symmetrical multiprocessing
HyperTransport™ technology	A high-speed, low latency, point-to-point communication link, providing greater bandwidth between system components	Helps reduce the number of buses in a system, which can reduce system bottlenecks and enable today's faster microprocessors to use system memory more efficiently in high-end multiprocessing systems
Integrated Memory Controller	Directly connects CPUs to memory, optimizing memory performance and bandwidth per CPU	Reduces latencies during memory access resulting in increased performance and productivity
Multi-core optimized	The extensive AMD64 architectural optimizations and features enabled thorough integration of multiple cores within the same processor, with each core having its own L1 and L2 caches	Offers improved performance and performance/watt
Simultaneous 32-bit and 64-bit computing	AMD64 technology enables a breakthrough approach to 64-bit computing that doubles the number of registers in the processor, and offers leading-edge performance on today's 32-bit software applications while enabling a seamless migration to the 64-bit computing future	Supports both 32-bit and 64-bit applications running at the same time Permits continued use of 32-bit software until the end user decides to transition to 64-bit software

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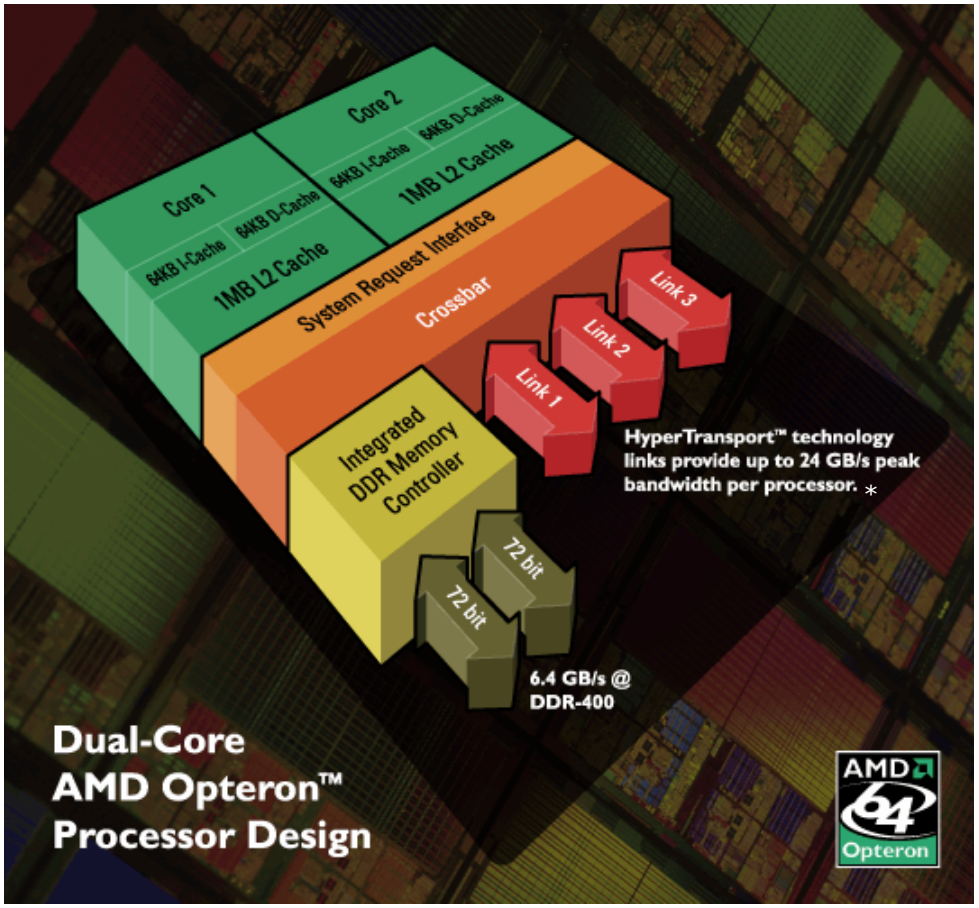
Server/Workstation Technologies (cont.)

FEATURE	FUNCTION	END USER BENEFIT
AMD PowerNow!™ Technology with OPM	Dynamically matches CPU performance to workload, optimizing power consumption and heat dissipation without any compromise in performance	Decrease overall power consumption for enterprise IT and workstation customers by optimizing performance-on-demand
AMD Virtualization (AMD-V)	Silicon feature-set enhancements designed to improve the performance, reliability, and security of existing and future virtualization environments.	Virtualization at hardware level supports more users while offering best performance
Enhanced Virus Protection	Sets part of system memory aside as 'data only' so resident code cannot be executed, only read from or written to	Safe guards mission critical data
Silicon-on-Insulator (SOI) technology	SOI technology is used to minimize substrate capacitive effects and leakage current for each of the millions of transistors within each AMD64 processor	AMD64 processors provide leading performance while also using less power when compared to competing processor designs
OPMA	OPMA defines a complete system interface that allows a wide range of management subsystems to be attached to server motherboards in a standardized way.	Standardized management subsystem infrastructure designed to spawn more accessible and cost-effective server management technology by enabling the development of a variety of solutions that span a range of capabilities and price points.

Dual-Core AMD Opteron™ Processor Architecture

- Designed for Dual-Core
- 940-Pin Socket Compatible
- No Changes in Power Envelope
- Non-disruptive migration



*100 Series has one HyperTransport link

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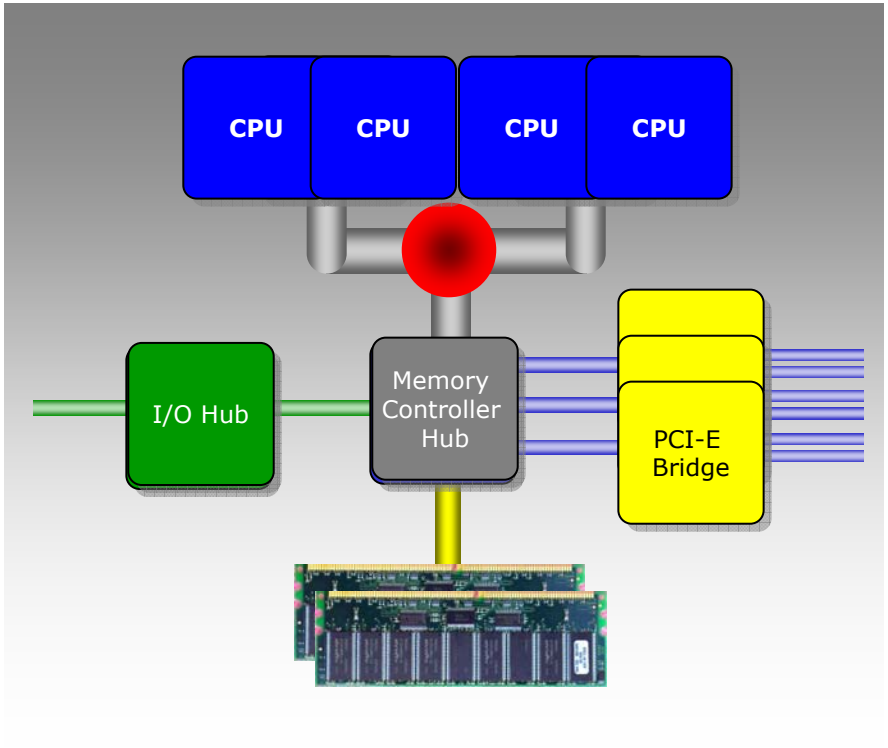
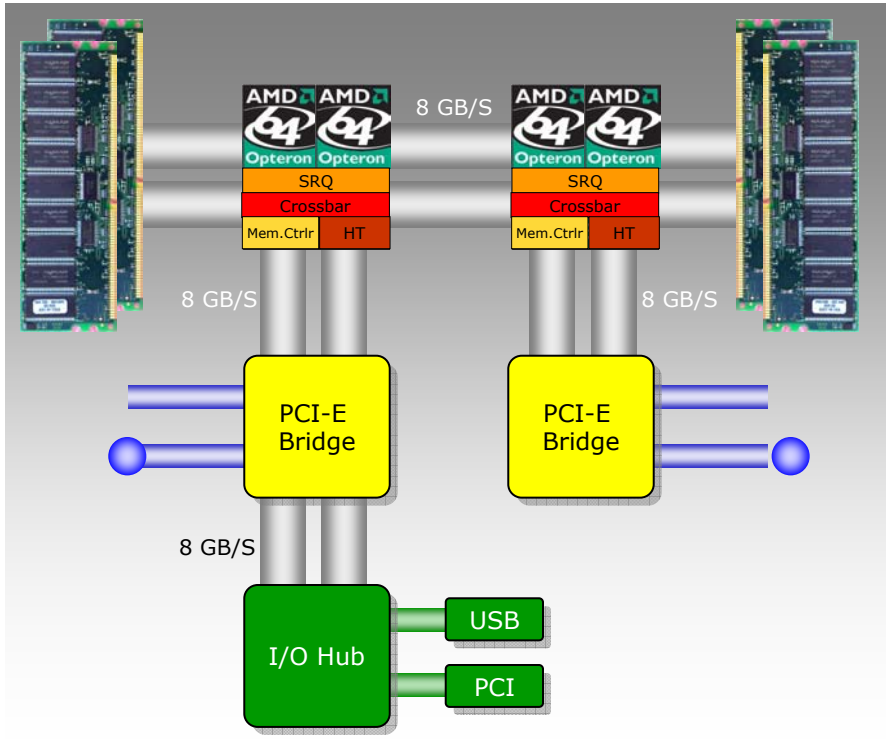
Eliminating Architectural Bottlenecks





Legacy x86 Architecture

- 20-year old front-side bus architecture
- CPUs, Memory, I/O all share a bus
- Major bottleneck to performance
- Faster CPUs or more cores ≠ performance

AMD64 Technology with Direct Connect Architecture

- Industry-standard AMD64 technology
- AMD's revolutionary Direct Connect Architecture eliminates FSB bottleneck
- HyperTransport™ Technology interconnect for high bandwidth and low latency

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Power Comparison and AMD PowerNow!™ Technology with OPM

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Technologies Enabling Increased Performance-Per-Watt

Advanced Process Technology

Silicon-on-Insulator
Fast transistors with low power leakage
Reduces wasted power and heat

AMD PowerNow!™ technology with Optimized Power Management

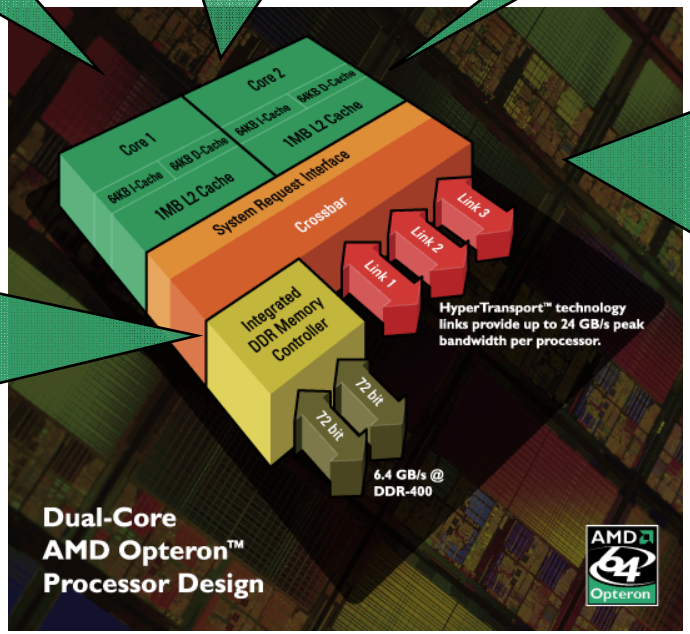
Dynamically **reduces processor power** based on workload **up to 75% savings in power** per processor at CPU idle!

Dual-Core native design

Increases performance-per-watt efficiencies **without increased power**

Integrated Memory Controller

Lower Power consumption memory controller power included in processor power budget vs. **22watts to ~48watts required by external memory controllers**!



Direct Connect Architecture

Provides **fast I/O throughput**
• I/O directly connected

Provides **fast CPU-to-CPU communication**
• CPUs directly connected

Integrated memory controller helps **increase performance by reducing memory latencies**

• Memory directly connected

HELPS REDUCE THE TRADITIONAL x86 FRONT-SIDE BUS BOTTLENECKS

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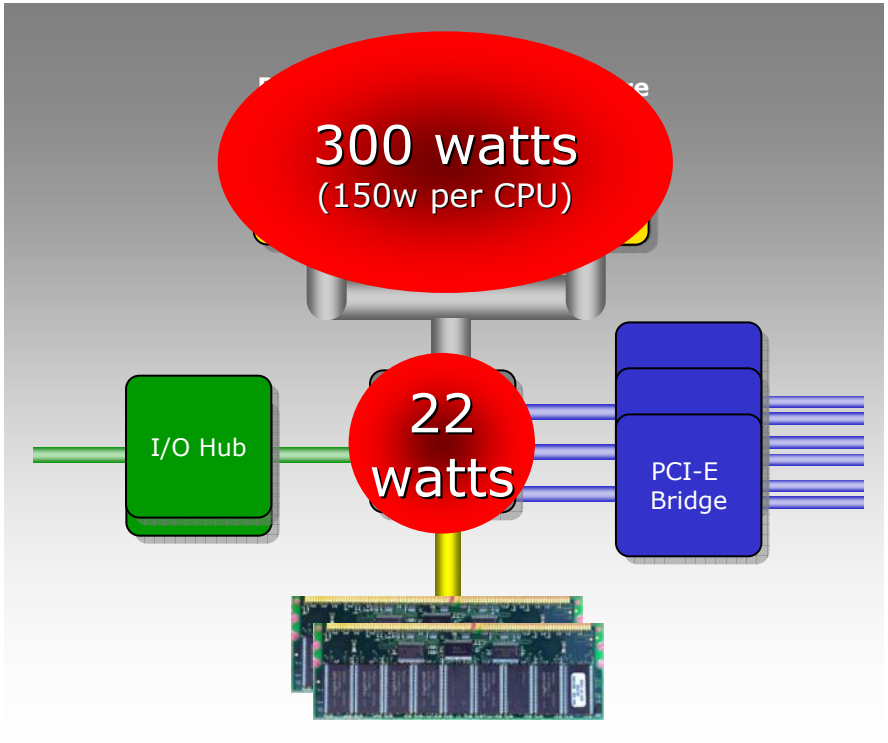
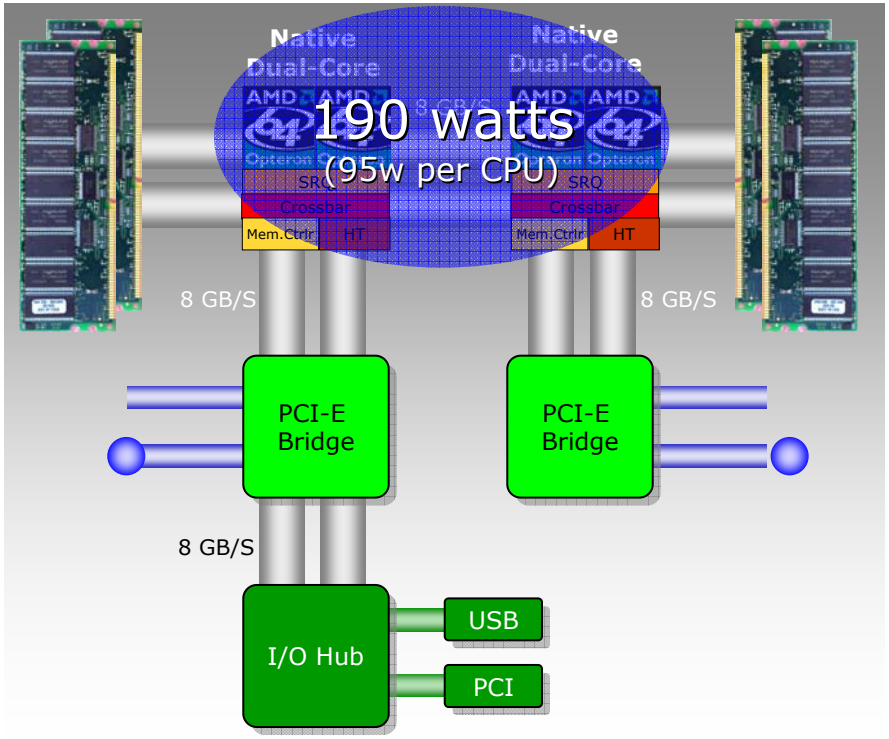
Today's Competitive Landscape

Power Consumption Comparison





Traditional Front side bus architecture

- 300 watts for processors (150w each)
- 22 watts for external memory controller

322 watts

Direct Connect Architecture

- 190 watts for processors (only 95w each)
- Integrated memory controllers

190 watts

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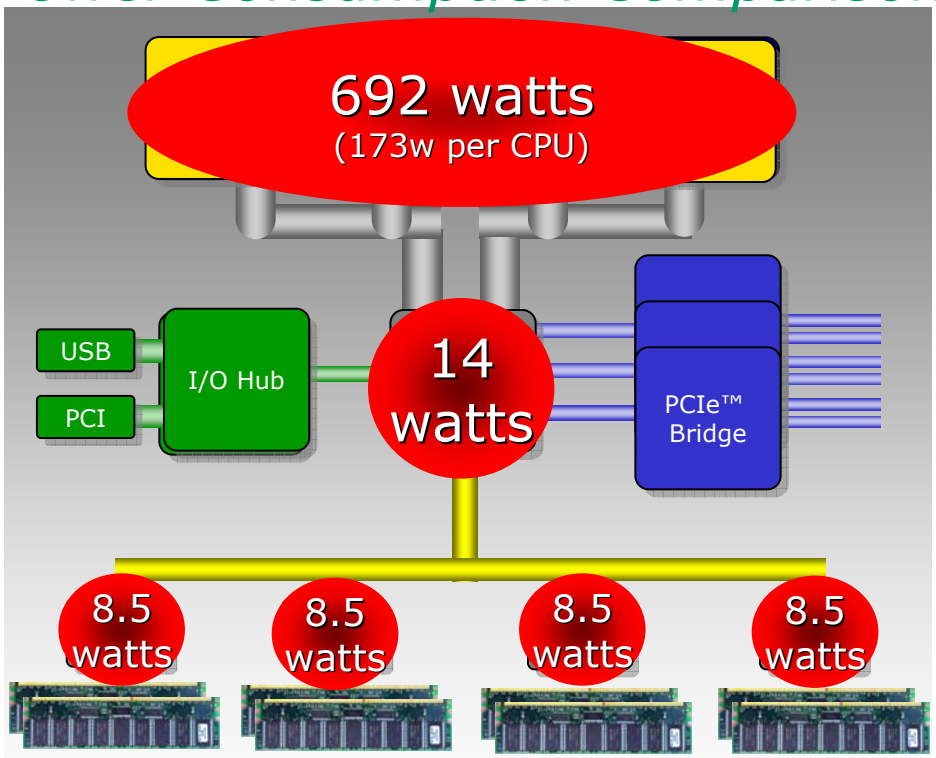
Today's Competitive Landscape

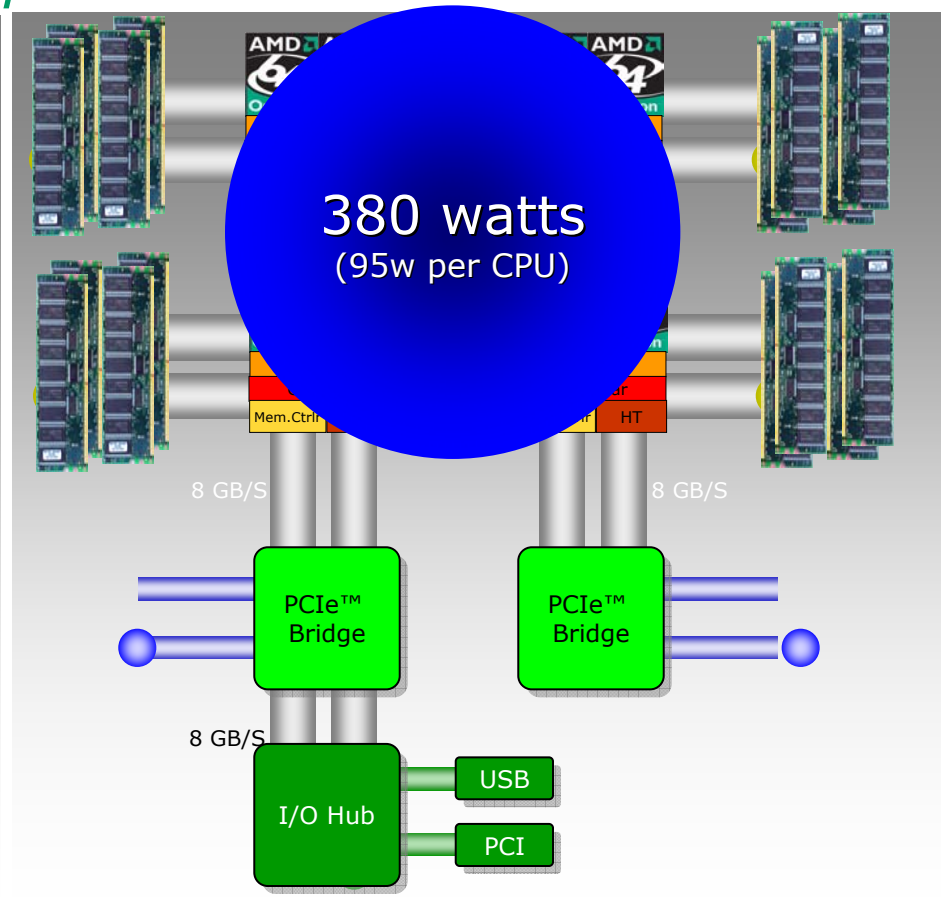
Power Consumption Comparison



Traditional Front side bus architecture

- 692 watts for processors (173w each)
- 48 watts for external memory controller

740 watts



Direct Connect Architecture

- 380 watts for processors (only 95w each)
- Integrated memory controllers

380 watts

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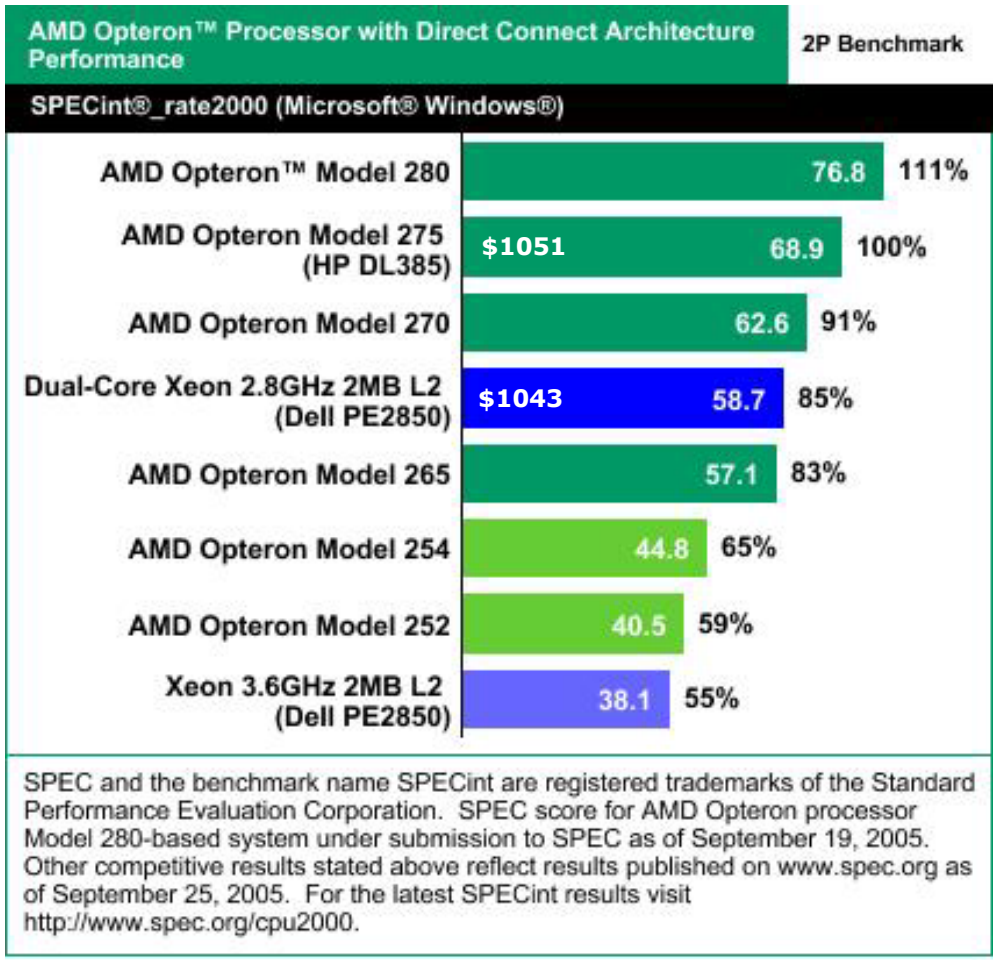
Dual-Core AMD Opteron™ vs. Dual-Core Intel Xeon



SPEC and the benchmark name SPECint are registered trademarks of the Standard Performance Evaluation Corporation. SPEC score for AMD Opteron processor Model 280-based system under submission to SPEC as of September 19, 2005. Other competitive results stated above reflect results published on www.spec.org as of September 25, 2005. For the latest SPECint results visit http://www.spec.org/cpu2000.

Key Takeaways

AMD Opteron™ Model 280 outperforms the Dual-Core Xeon 2.8GHz 2MB L2 by **31%**

At **similar pricing** the AMD Opteron™ Model 275 outperforms the similarly-priced Dual-Core Xeon 2.8GHz 2MB L2 by **17%**

Dual-core Xeon CPUs consume **58% more power than Dual-Core AMD Opteron**

- and **172% more power than AMD Opteron™ HE processors (almost 3X)**

See **www.amd.com/benchmarks** for more performance information

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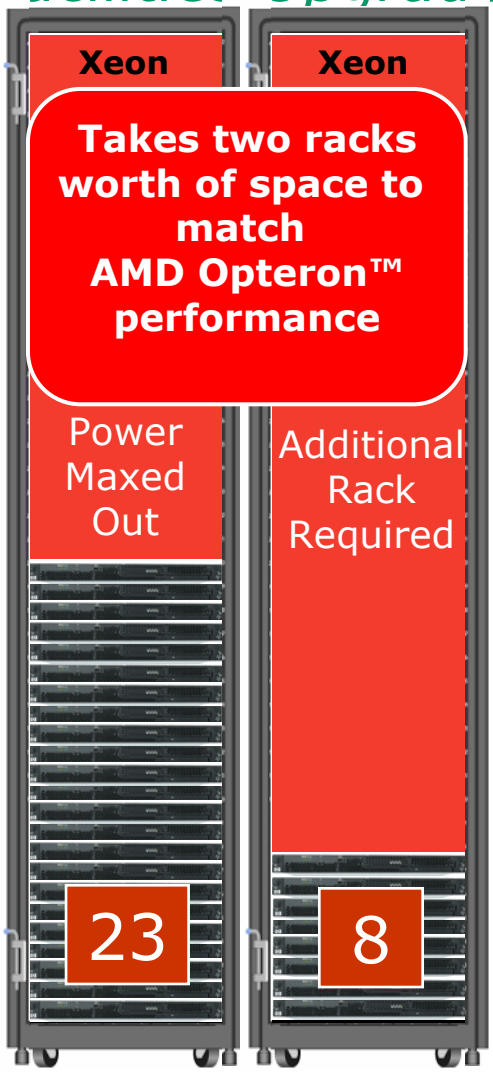
AMD Opteron™ Processor Power Advantage

Increasing Density without Facilities Upgrades

(42u rack)
Power Drop of 9 KVA

vs.



Increasing TCO with Xeon

- Added cost for floor space
- Added cost for additional servers
- Added cost for power drop
- Added cost for Rack enclosure
- Added cost for switches/UPS
- Added cost for cooling
- Added cost for software licenses
- Added cost for IT support

Additional Rack Required to match AMD Opteron™ platforms performance (due to Xeon platforms power requirements)

- Performance based on SPECweb®99_SSL
- 82,244 connections

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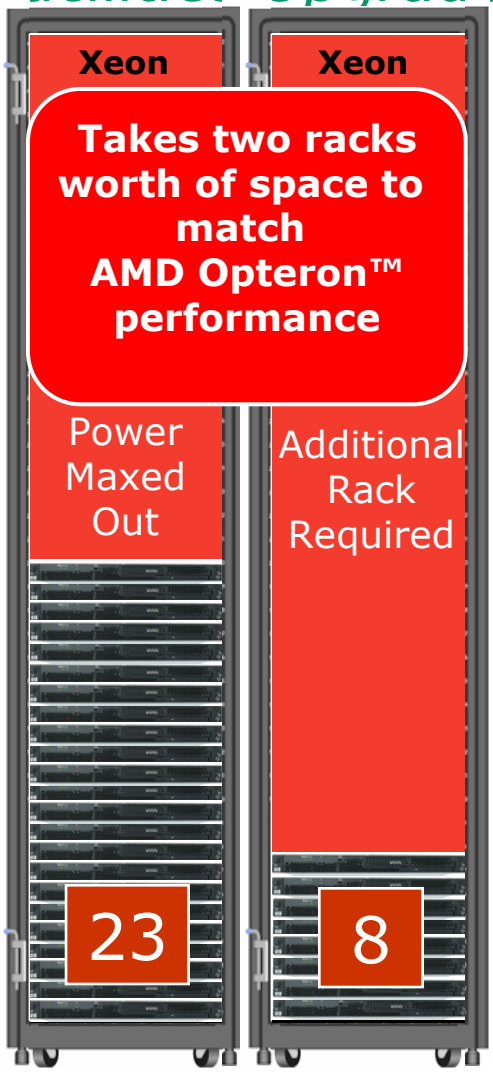
AMD Opteron™ Processor Power Advantage

Increasing Density without Facilities Upgrades

(42u rack)
Power Drop of 9 KVA

vs.



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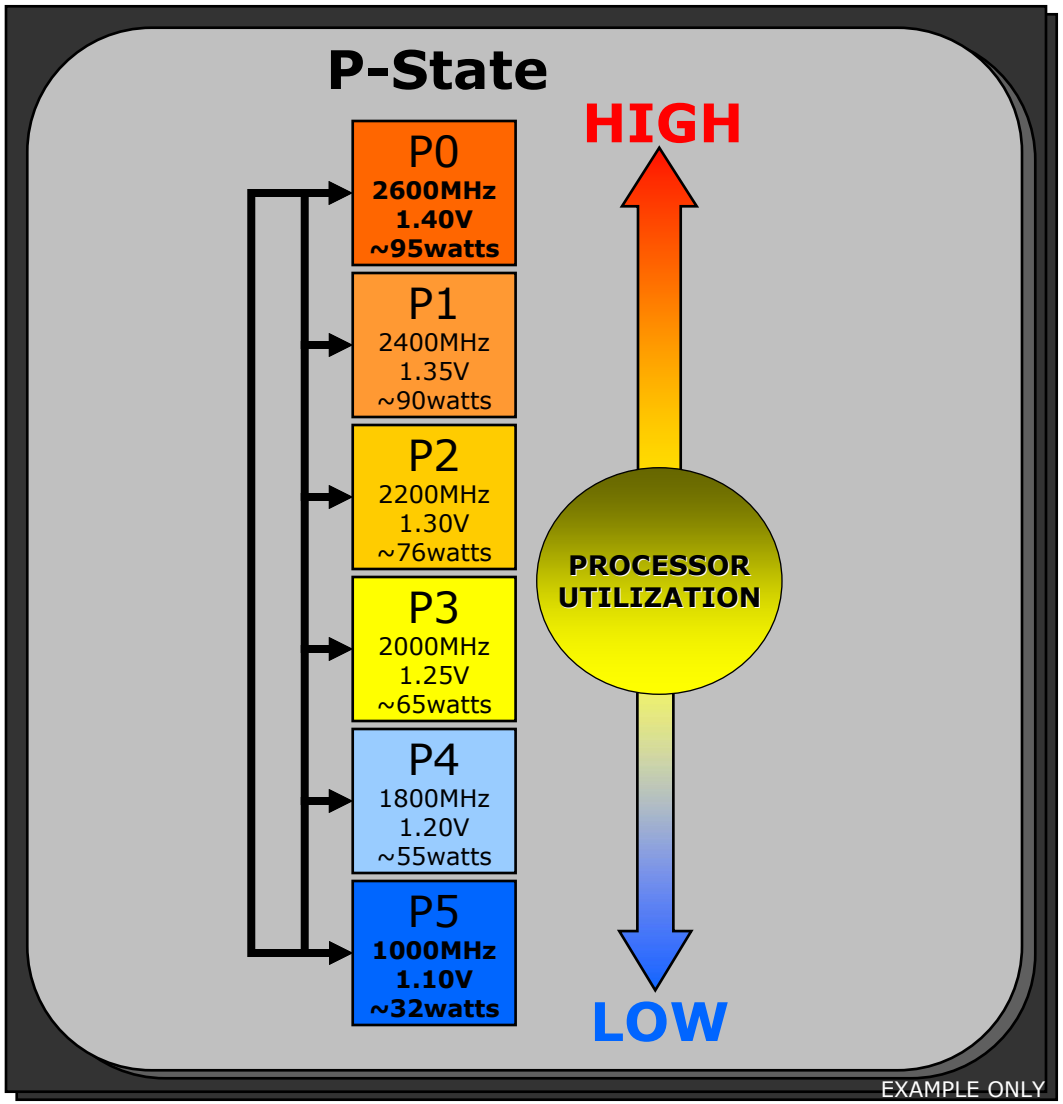
AMD PowerNow!™ technology with OPM



- Utilizes AMD PowerNow!™ technology with Optimized Power Management
- Multiple performance states for optimized power management
- Dynamically reduces processor power based on workload
- Lowers power consumption without compromising performance
- Leverages industry standards
- Up to 75% CPU power savings at idle

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Near-Term Product Outlook

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Near-Term Product Outlook

SINGLE- AND DUAL-CORE AMD OPTERON™ PROCESSOR

UPCOMING FEATURES AND TECHNOLOGIES (Q3 2006)

- DDR2
- RAS Enhancements
- AMD Virtualization

CURRENT FEATURES AND TECHNOLOGIES

- AMD64
- Native Dual-core
- 90nm SOI
- Direct Connect Architecture
- Simultaneous 32- and 64-bit computing
- DDR
- HyperTransport™ technology offering up to 8.0 GB/s per link
- AMD PowerNow!™ technology with Optimized Power Management (OPM)

SEGMENTS

- Commercial Enterprise, Small and Medium Business Segments

Processor Roadmap and Features

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AMD Opteron™ 800 Series Roadmap

	1Q06		2Q06	
Standard	854 852 850 848 846 844	**885** 880 875 870 865	**856** 854 852 850 848 846	885 880 875 870 865
HE	850 HE 848 HE 846 HE	**875 HE** 870 HE 865 HE 860 HE	850 HE 848 HE 846 HE	875 HE 870 HE 865 HE 860 HE

AMD Opteron™ processors have 18 months longevity.

Black = Socket 940 **Bold Text = Production BXS** ☐ = Dual Core

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AMD Opteron™ 800 Series Features

Model	Clock Freq	L2 Cache	Socket	System Bus Speed[1]	Core	Max DDR1 MHz	PN[2]	AMD-V[3]	EVP[4]	OPMA	MAX TDP
AMD Opteron™ 800 Series processors											
885	2.6 GHz	1MB x2	940	2000 MT/s	Dual	400	Yes	No	Yes	Yes	95W
880	2.4 GHz	1MB x2	940	2000 MT/s	Dual	400	Yes	No	Yes	Yes	95W
875	2.2 GHz	1MB x2	940	2000 MT/s	Dual	400	Yes	No	Yes	Yes	95W
870	2.0 GHz	1MB x2	940	2000 MT/s	Dual	400	Yes	No	Yes	Yes	95W
865	1.8 GHz	1MB x2	940	2000 MT/s	Dual	400	Yes	No	Yes	Yes	95W
856	3.0 GHz	1MB	940	2000 MT/s	Single	400	Yes	No	Yes	Yes	95W
854	2.8 GHz	1MB	940	2000 MT/s	Single	400	Yes	No	Yes	Yes	95W
852	2.6 GHz	1MB	940	2000 MT/s	Single	400	Yes	No	Yes	Yes	95W
850	2.4 GHz	1MB	940	2000 MT/s	Single	400	Yes	No	Yes	Yes	95W
848	2.2 GHz	1MB	940	2000 MT/s	Single	400	Yes	No	Yes	Yes	95W
846	2.0 GHz	1MB	940	2000 MT/s	Single	400	Yes	No	Yes	Yes	95W
844	1.8 GHz	1MB	940	2000 MT/s	Single	400	Yes	No	Yes	Yes	95W

[1]2000MT/s @1000MHz HyperTransport Speed
[2]PN = AMD PowerNow™ technology with OPM
[3]AMD-V = AMD Virtualization
[4]EVP = Enhanced Virus Protection

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AMD Opteron™ 800 Series HE Features

Model	Clock Freq	L2 Cache	Socket	System Bus Speed[1]	Core	Max DDR1 MHz	PN[2]	AMD-V[3]	EVP[4]	OPMA	MAX TDP
AMD Opteron™ 800 Series HE processors											
875 HE	2.2 GHz	1MB x2	940	2000 MT/s	Dual	400	Yes	No	Yes	Yes	55W
870 HE	2.0 GHz	1MB x2	940	2000 MT/s	Dual	400	Yes	No	Yes	Yes	55W
865 HE	1.8 GHz	1MB x2	940	2000 MT/s	Dual	400	Yes	No	Yes	Yes	55W
860 HE	1.6 GHz	1MB x2	940	2000 MT/s	Dual	400	Yes	No	Yes	Yes	55W
850 HE	2.4 GHz	1MB	940	2000 MT/s	Single	400	Yes	No	Yes	Yes	55W
848 HE	2.2 GHz	1MB	940	2000 MT/s	Single	400	Yes	No	Yes	Yes	55W
846 HE	2.0 GHz	1MB	940	2000 MT/s	Single	400	Yes	No	Yes	Yes	55W

[1]2000MT/s @1000MHz HyperTransport Speed
[2]PN = AMD PowerNow™ technology with OPM
[3]AMD-V = AMD Virtualization
[4]EVP = Enhanced Virus Protection

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AMD Opteron™ 200 Series Roadmap

	1Q06		2Q06	
Standard	254 252 250 248 246 244	**285** 280 275 270 265	**256** 254 252 250 248 246	285 280 275 270 265
HE	250 HE 248 HE 246 HE	**275 HE** 270 HE 265 HE 260 HE	250 HE 248 HE 246 HE	275 HE 270 HE 265 HE 260 HE

AMD Opteron™ processors have 18 months longevity.

Black = Socket 940 **Bold Text = Production BXS** = Dual Core

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AMD Opteron™ 200 Series Features

Model	Clock Freq	L2 Cache	Socket	System Bus Speed[1]	Core	Max DDR1 MHz	PN[2]	AMD-V[3]	EVP[4]	OPMA	MAX TDP
AMD Opteron™ 200 Series processors											
285	2.6 GHz	1MB x2	940	2000 MT/s	Dual	400	Yes	No	Yes	Yes	95W
280	2.4 GHz	1MB x2	940	2000 MT/s	Dual	400	Yes	No	Yes	Yes	95W
275	2.2 GHz	1MB x2	940	2000 MT/s	Dual	400	Yes	No	Yes	Yes	95W
270	2.0 GHz	1MB x2	940	2000 MT/s	Dual	400	Yes	No	Yes	Yes	95W
265	1.8 GHz	1MB x2	940	2000 MT/s	Dual	400	Yes	No	Yes	Yes	95W
256	3.0 GHz	1MB	940	2000 MT/s	Single	400	Yes	No	Yes	Yes	95W
254	2.8 GHz	1MB	940	2000 MT/s	Single	400	Yes	No	Yes	Yes	95W
252	2.6 GHz	1MB	940	2000 MT/s	Single	400	Yes	No	Yes	Yes	95W
250	2.4 GHz	1MB	940	2000 MT/s	Single	400	Yes	No	Yes	Yes	95W
248	2.2 GHz	1MB	940	2000 MT/s	Single	400	Yes	No	Yes	Yes	95W
246	2.0 GHz	1MB	940	2000 MT/s	Single	400	Yes	No	Yes	Yes	95W
244	1.8 GHz	1MB	940	2000 MT/s	Single	400	Yes	No	Yes	Yes	95W

[1]2000MT/s @1000MHz HyperTransport Speed
[2]PN = AMD PowerNow™ technology with OPM
[3]AMD-V = AMD Virtualization
[4]EVP = Enhanced Virus Protection

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AMD Opteron™ 200 Series HE Features

Model	Clock Freq	L2 Cache	Socket	System Bus Speed[1]	Core	Max DDR1 MHz	PN[2]	AMD-V[3]	EVP[4]	OPMA	MAX TDP
AMD Opteron™ 200 Series HE processors											
275 HE	2.2 GHz	1MB x2	940	2000 MT/s	Dual	400	Yes	No	Yes	Yes	55W
270 HE	2.0 GHz	1MB x2	940	2000 MT/s	Dual	400	Yes	No	Yes	Yes	55W
265 HE	1.8 GHz	1MB x2	940	2000 MT/s	Dual	400	Yes	No	Yes	Yes	55W
260 HE	1.6 GHz	1MB x2	940	2000 MT/s	Dual	400	Yes	No	Yes	Yes	55W
250 HE	2.4 GHz	1MB	940	2000 MT/s	Single	400	Yes	No	Yes	Yes	55W
248 HE	2.2 GHz	1MB	940	2000 MT/s	Single	400	Yes	No	Yes	Yes	55W
246 HE	2.0 GHz	1MB	940	2000 MT/s	Single	400	Yes	No	Yes	Yes	55W

[1]2000MT/s @1000MHz HyperTransport Speed
[2]PN = AMD PowerNow™ technology with OPM
[3]AMD-V = AMD Virtualization
[4]EVP = Enhanced Virus Protection

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AMD Opteron™ 100 Series Roadmap

	1Q06		2Q06	
Standard	154 152 152 150 148 146 144	**185** 180 175 170 165	154 152 152 150 148 146 144	185 180 175 170 165

AMD Opteron™ processors have 18 months longevity.

Pink = Socket 940
Black = Socket 939

Bold Text = Production BXS

= Dual Core

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AMD Opteron™ 100 Series Features

Model	Clock Freq	L2 Cache	Socket	System Bus Speed[1]	Core	Max DDR1 MHz	PN[2]	AMD-V[3]	EVP[4]	OPMA	MAX TDP
AMD Opteron™ 100 Series processors (939-pin)											
185	2.6GHz	1MB x2	939	2000 MT/s	Dual	400	Yes	No	Yes	Yes	110W
180	2.4GHz	1MB x2	939	2000 MT/s	Dual	400	Yes	No	Yes	Yes	110W
175	2.2GHz	1MB x2	939	2000 MT/s	Dual	400	Yes	No	Yes	Yes	110W
170	2.0GHz	1MB x2	939	2000 MT/s	Dual	400	Yes	No	Yes	Yes	110W
165	1.8GHz	1MB x2	939	2000 MT/s	Dual	400	Yes	No	Yes	Yes	110W
154	2.8GHz	1MB	939	2000 MT/s	Single	400	Yes	No	Yes	Yes	104W
152	2.6GHz	1MB	939	2000 MT/s	Single	400	Yes	No	Yes	Yes	104W
150	2.4GHz	1MB	939	2000 MT/s	Single	400	Yes	No	Yes	Yes	85W
148	2.2GHz	1MB	939	2000 MT/s	Single	400	Yes	No	Yes	Yes	85W
146	2.0GHz	1MB	939	2000 MT/s	Single	400	Yes	No	Yes	Yes	67W
144	1.8GHz	1MB	939	2000 MT/s	Single	400	Yes	No	Yes	Yes	67W
AMD Opteron™ 100 Series processors (940-pin)											
152	2.6GHz	1MB	940	2000 MT/s	Single	400	Yes	No	Yes	Yes	95W

[1]2000MT/s @1000MHz HyperTransport Speed
[2]PN = AMD PowerNow™ technology with OPM
[3]AMD-V = AMD Virtualization
[4]EVP = Enhanced Virus Protection

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Distribution Product Offering - PIB and WOF

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Distribution Product Offerings

AMD Opteron™ processors are available through authorized AMD Distributors and are offered in two package types – PIB and WOF

For a list of authorized distributors in your region see AMD's website at:
http://www.amd.com/us-en/Processors/TechnicalResources/0,,30_182_3559_710,00.html

PIB (Processor in BOX)

- Warranty: 3-year
- Heatsink: Full-tower
- Qty: 1 CPU per PIB
- **Recommended For:** Full Tower/Pedestal systems*

WOF (PIB Without Fan)

- Warranty: 3-year
- Heatsink: None
- Qty: 1 CPU per WOF
- **Recommended For:** Rack-dense or Blade systems

*Using a PIB processor without the included heatsink voids the 3-year warranty; WOF product should be used for rack-dense solutions.

Note: Tray product with 1-year warranty may also be offered through authorized AMD distributors. Because of their 3-year warranty, AMD recommends using WOF and PIB instead of tray. AMD offers tray to provide customer choice where PIB/WOF orders may be logistically challenging (ex, for very large orders).

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Distribution Product Offerings – AMD Opteron™ Processor Tray, PIB and WOF OPNs

AMD Opteron™ 100 Series			AMD Opteron 200 Series				AMD Opteron 800 Series		
Model	Tray OPN	PIB OPN	Model	Tray OPN	PIB OPN	WOF OPN	Model	Tray OPN	WOF OPN
144	OSA144DAA5BN	OSA144BNBOX	244	OSA244FAA5BL	OSA244BLBOX	OSA244BLWOF	844	OSA844FAA5BM	OSA844BMWOF
146	OSA146DAA5BN	OSA146BNBOX	246	OSA246FAA5BL	OSA246BLBOX	OSA246BLWOF	846	OSA846FAA5BM	OSA846BMWOF
148	OSA148DAA5BN	OSA148BNBOX	248	OSA248FAA5BL	OSA248BLBOX	OSA248BLWOF	848	OSA848FAA5BM	OSA848BMWOF
150	OSA150DAA5BN	OSA150BNBOX	250	OSA250FAA5BL	OSA250BLBOX	OSA250BLWOF	850	OSA850FAA5BM	OSA850BMWOF
152	OSA152DAA5BN	OSA152BNBOX	252	OSA252FAA5BL	OSA252BLBOX	OSA252BLWOF	852	OSA852FAA5BM	OSA852BMWOF
154	OSA154DAA5BN	OSA154BNBOX	254	OSA254FAA5BL	OSA254BLBOX	OSA254BLWOF	854	OSA854FAA5BM	OSA854BMWOF
165	OSA165DAA6CD	OSA165CDBOX	265	OSA265FAA6CB	OSA265CBBOX		865	OSA865FAA6CC	OSA865CCWOF
170	OSA170DAA6CD	OSA170CDBOX	270	OSA270FAA6CB	OSA270CBBOX		870	OSA870FAA6CC	OSA870CCWOF
175	OSA175DAA6CD	OSA175CDBOX	275	OSA275FAA6CB	OSA275CBBOX		875	OSA875FAA6CC	OSA875CCWOF
180	OSA180DAA6CD	OSA180CDBOX	280	OSA280FAA6CB	OSA280CBBOX		880	OSA880FAA6CC	OSA880CCWOF
185	OSA185DAA6CD	OSA185CDBOX	285	OSA285FAA6CB	OSA285CBBOX		885	OSA885FAA6CC	OSA885CCWOF
			246 HE	OSK246FAA5BL	OSK246BLBOX				
			248 HE	OSK248FAA5BL	OSK248BLBOX	OSK248BLWOF	848 HE	OSK848FAA5BM	OSK848BMWOF
			250 HE	OSK250FAA5BL	OSK250BLBOX	OSK250BLWOF	850 HE	OSK850FAA5BM	OSK850BMWOF
			260 HE	OSK260FAA6CB	OSK260CBBOX		860 HE	OSK860FAA6CC	
			265 HE	OSK265FAA6CB	OSK265CBBOX		865 HE	OSK865FAA6CC	
			270 HE	OSK270FAA6CB	OSK270CBBOX		870 HE	OSK870FAA6CC	
			275 HE	OSK275FAA6CB	OSK275CBBOX		875 HE	OSK875FAA6CC	

Notes:
1. AMD Opteron™ 100 Series is not offered in "HE" or in WOF
2. AMD Opteron 800 Series is not offered in PIB.
3. Distributor part numbers may differ from the OPNs listed here.

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Next-Generation Product Offerings

The table below outlines AMD's planned product offerings for next-generation (DDR2-based) AMD Opteron™ processors

- Please note that the **next generation 2-way AMD Opteron processor will not be offered in standard PIB**
- A list of AMD Recommended "Full-Sized" Heatsinks is available for customers currently purchasing 200 Series PIB for use in Pedestal/Tower Servers and Workstations
  - Please contact an AMD authorized distributor or your AMD account representative for details

Next-Generation AMD Opteron product offerings:

	68W HE			95W (standard)		
	PIB	WOF	Tray	PIB	WOF	Tray
1-way				Yes	Yes	Yes
Up to 2-way	No	Yes	Yes	No	Yes	Yes
4-8-way	No	No	Yes	No	Yes	Yes

Do Not Distribute

Benefits of AMD Opteron™ Processor WOF

Q: Why buy WOF instead of tray?

A: WOF comes with a 3-year warranty while tray comes with a 1-year warranty. And because it is easier to purchase and carry, WOF product may be more readily available via distribution.

Q: Why buy WOF instead of PIB?

A: Customers developing rack-dense AMD Opteron processor solutions should purchase WOF instead of PIB.

- While both WOF and PIB come with a 3-year warranty, a PIB customer voids their 3-year warranty if they do not use the included AMD heatsink.
- AMD will always price WOF less than PIB.
- With WOF there's no heatsink to dispose of.
- No heatsink to return under RMA with WOF

Q: How do I identify WOF products to order them?

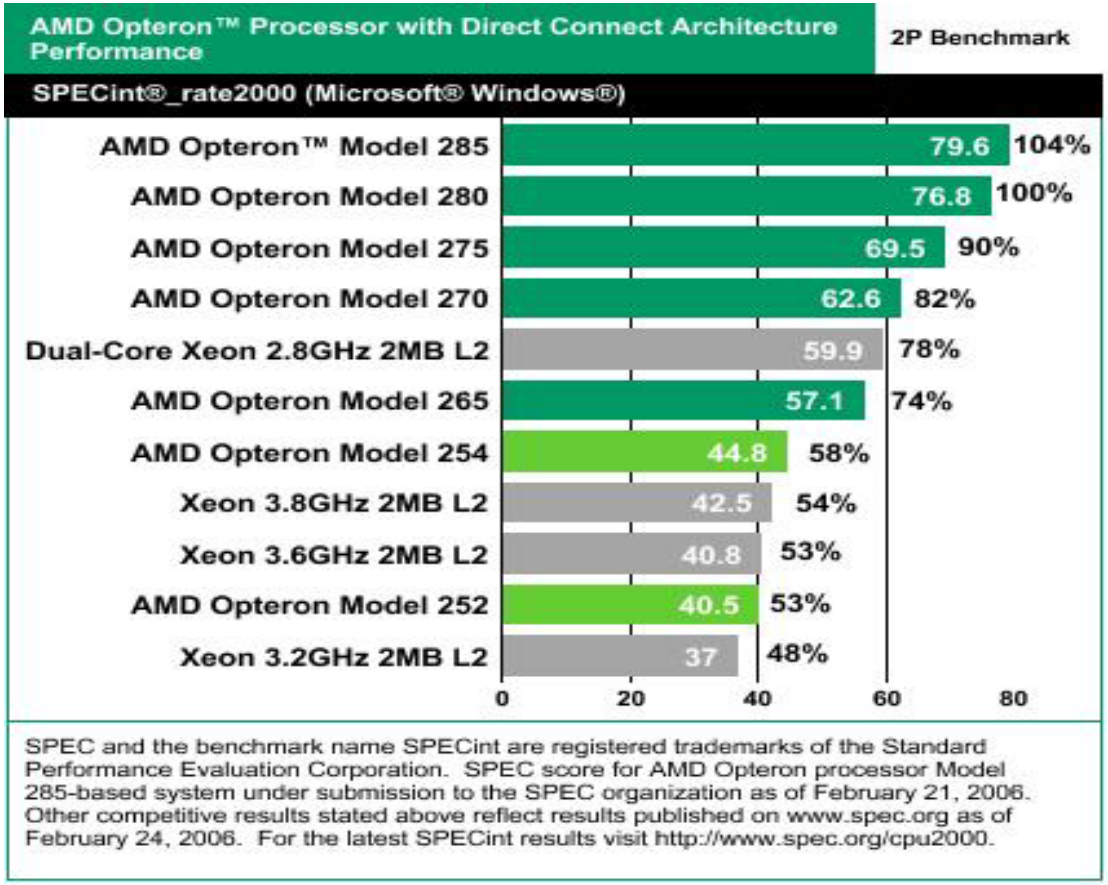
A: All WOF products have the letters "WOF" included in their OPN.

Do Not Distribute

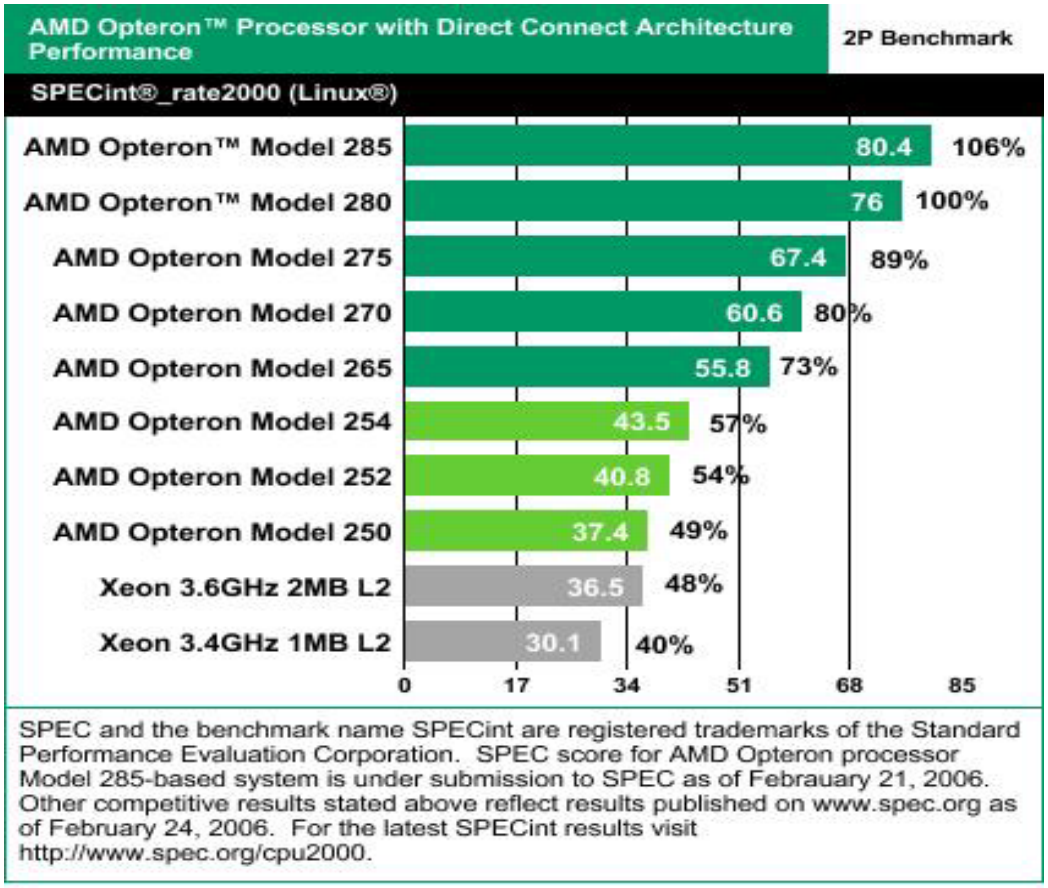
Benchmarks

Do Not Distribute

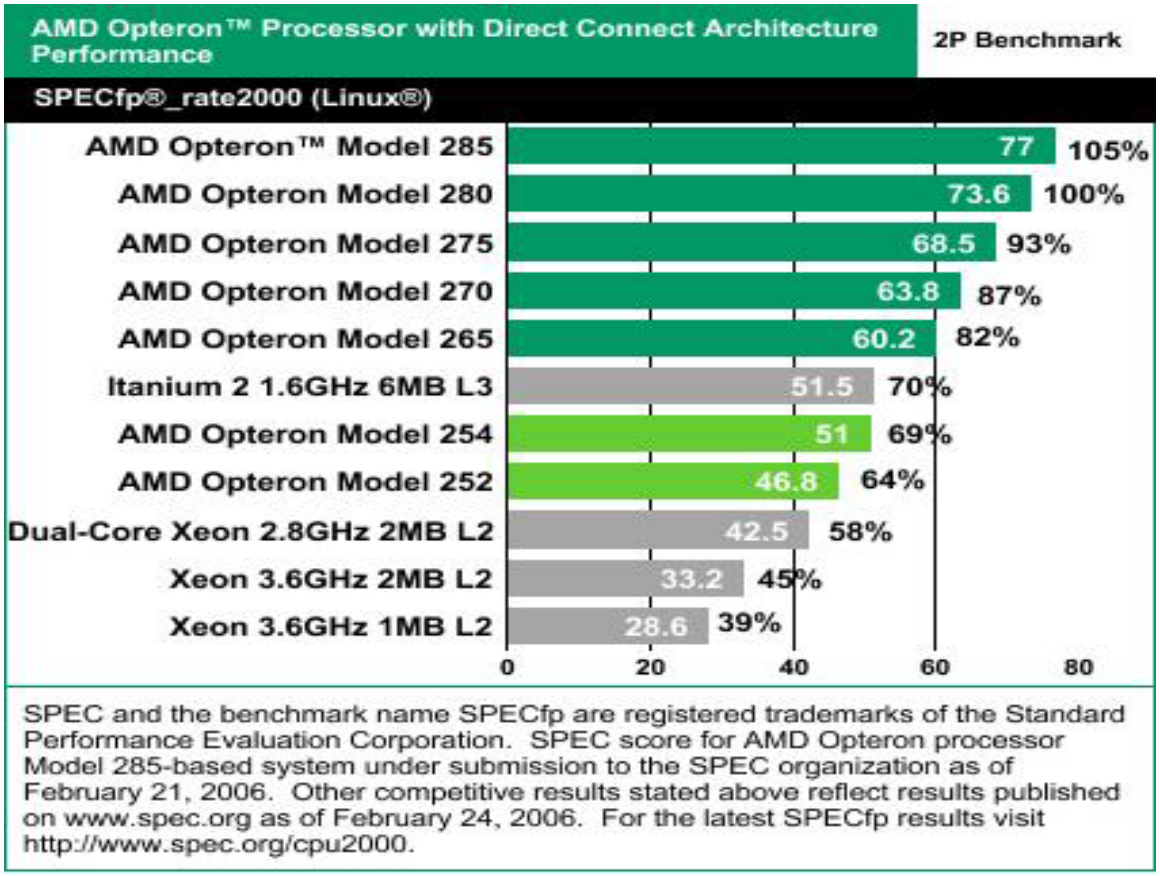
Integer Performance
SPECint®_rate2000



Integer Performance
SPECint®_rate2000

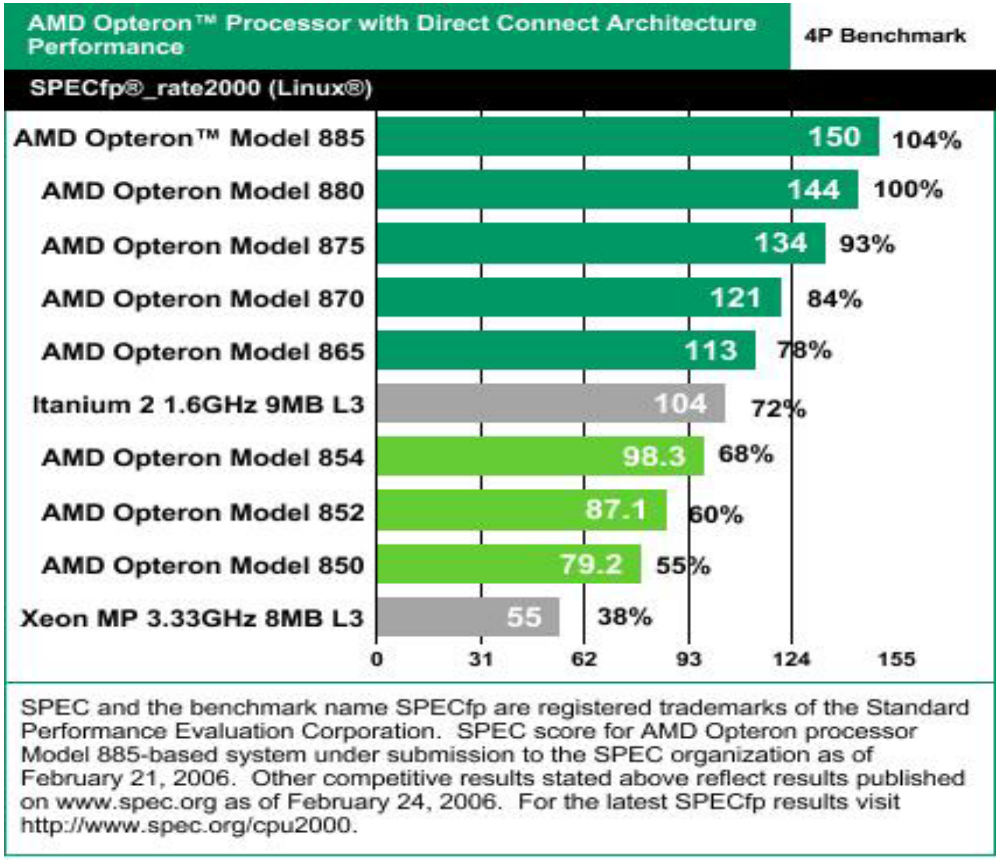


Floating Point Performance
SPECfp®_rate2000



SPEC and the benchmark name SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. SPEC score for AMD Opteron processor Model 285-based system under submission to the SPEC organization as of February 21, 2006. Other competitive results stated above reflect results published on www.spec.org as of February 24, 2006. For the latest SPECfp results visit http://www.spec.org/cpu2000.

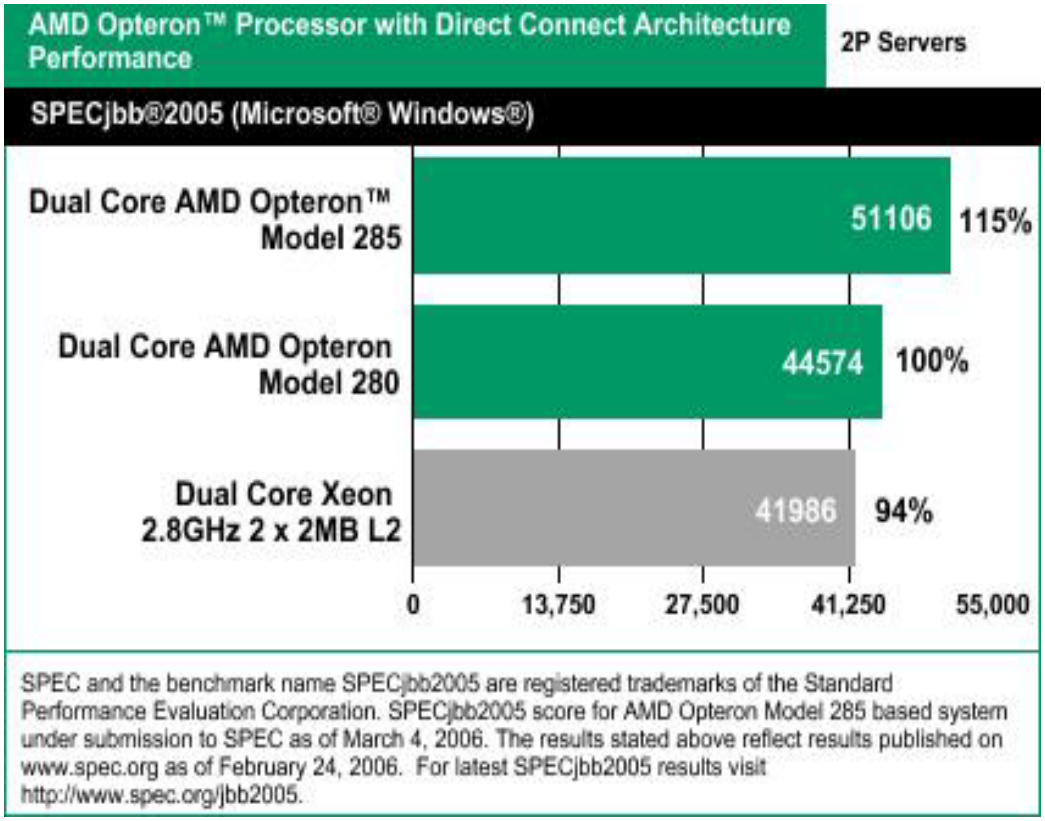
Floating Point Performance
SPECfp®_rate2000



SPEC and the benchmark name SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. SPEC score for AMD Opteron processor Model 885-based system under submission to the SPEC organization as of February 21, 2006. Other competitive results stated above reflect results published on www.spec.org as of February 24, 2006. For the latest SPECfp results visit http://www.spec.org/cpu2000.

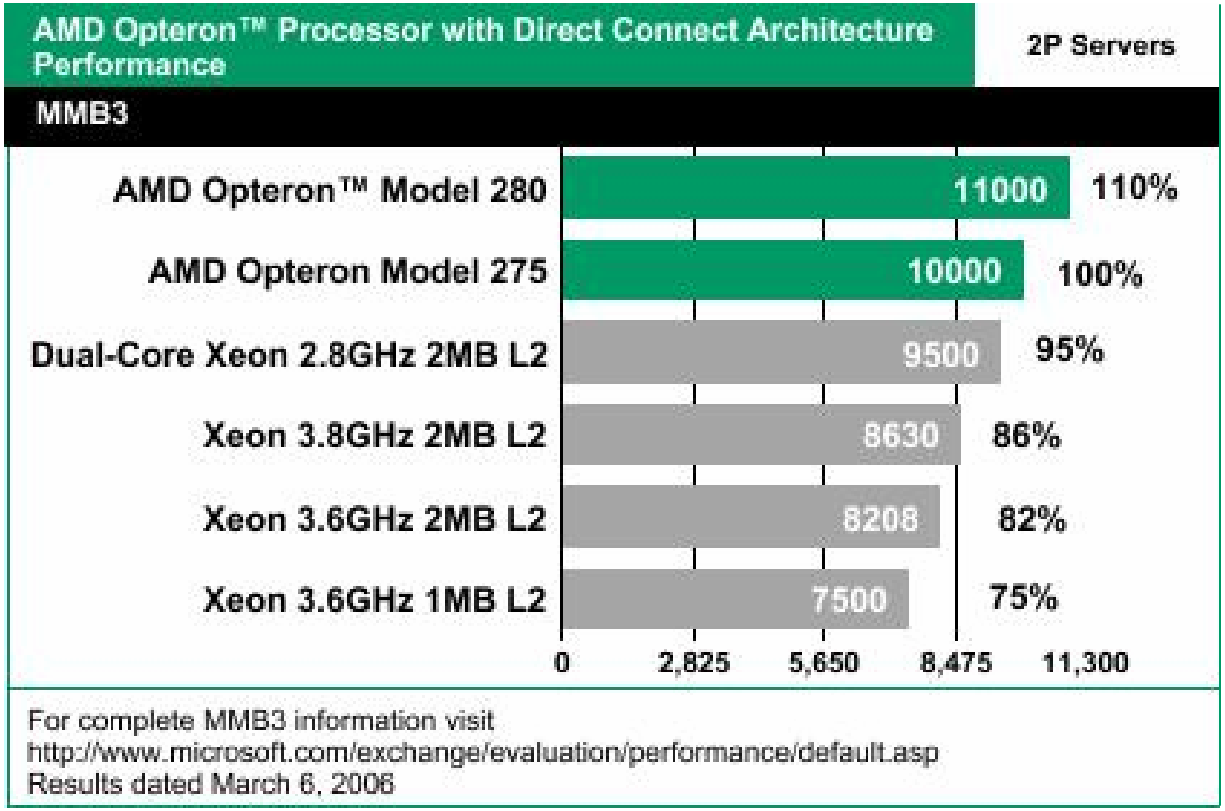
Do Not Distribute

Java Applications Performance
SPECJBB®2005


AMD Opteron™ Processor with Direct Connect Architecture Performance
2P Servers
SPECjbb®2005 (Microsoft® Windows®)
Dual Core AMD Opteron™ Model 285
51106
115%
Dual Core AMD Opteron Model 280
44574
100%
Dual Core Xeon 2.8GHz 2 x 2MB L2
41986
94%
0
13,750
27,500
41,250
55,000
SPEC and the benchmark name SPECjbb2005 are registered trademarks of the Standard Performance Evaluation Corporation. SPECjbb2005 score for AMD Opteron Model 285 based system under submission to SPEC as of March 4, 2006. The results stated above reflect results published on www.spec.org as of February 24, 2006. For latest SPECjbb2005 results visit http://www.spec.org/jbb2005.

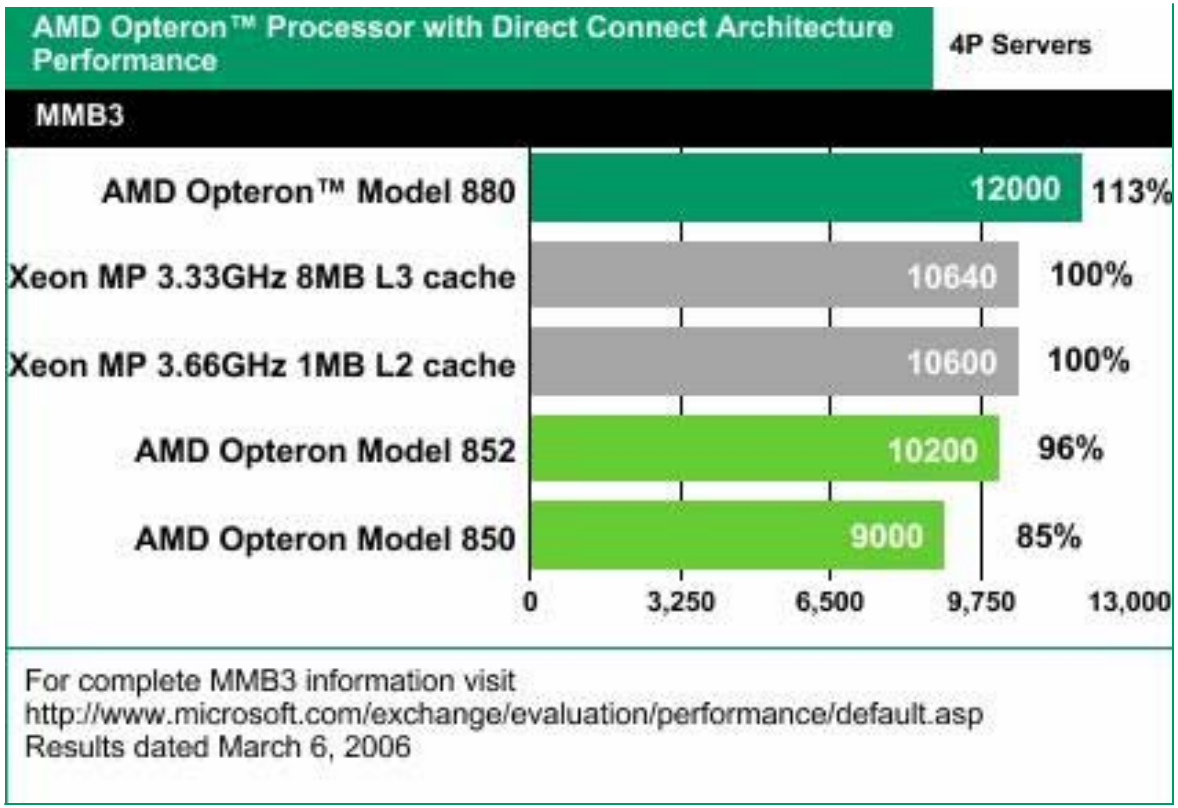
Do Not Distribute

Exchange Server Performance
Microsoft MMB3 – 2P Servers



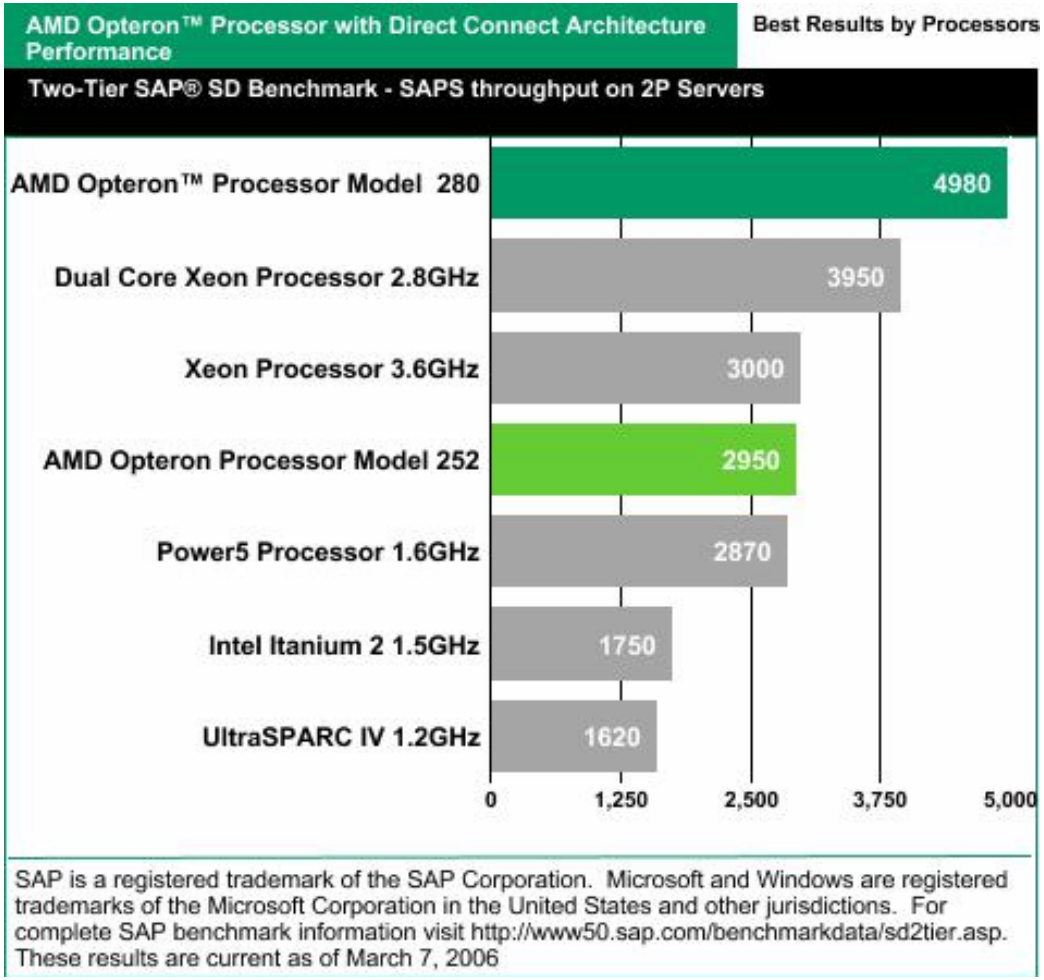
Do Not Distribute

Exchange Server Performance
Microsoft MMB3 – 4P Servers



Enterprise Resource Planning

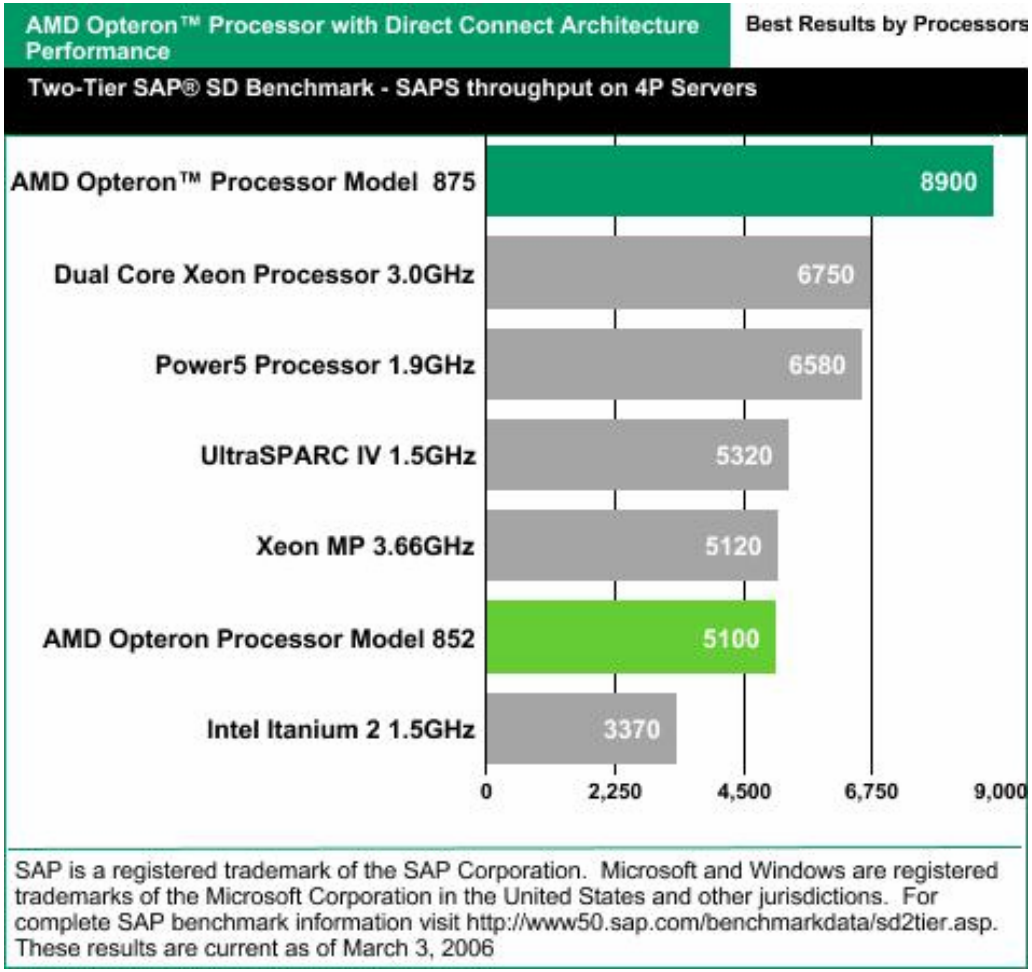
SAP® SD Benchmark - 2P Processors


AMD Opteron™ Processor with Direct Connect Architecture Performance
Best Results by Processors
Two-Tier SAP® SD Benchmark - SAPS throughput on 2P Servers
AMD Opteron™ Processor Model 280
4980
Dual Core Xeon Processor 2.8GHz
3950
Xeon Processor 3.6GHz
3000
AMD Opteron Processor Model 252
2950
Power5 Processor 1.6GHz
2870
Intel Itanium 2 1.5GHz
1750
UltraSPARC IV 1.2GHz
1620
0
1,250
2,500
3,750
5,000
SAP is a registered trademark of the SAP Corporation. Microsoft and Windows are registered trademarks of the Microsoft Corporation in the United States and other jurisdictions. For complete SAP benchmark information visit http://www50.sap.com/benchmarkdata/sd2tier.asp. These results are current as of March 7, 2006

Do Not Distribute

Enterprise Resource Planning

SAP® SD Benchmark - 4P Processors


AMD Opteron™ Processor with Direct Connect Architecture Performance
Best Results by Processors
Two-Tier SAP® SD Benchmark - SAPS throughput on 4P Servers
AMD Opteron™ Processor Model 875
8900
Dual Core Xeon Processor 3.0GHz
6750
Power5 Processor 1.9GHz
6580
UltraSPARC IV 1.5GHz
5320
Xeon MP 3.66GHz
5120
AMD Opteron Processor Model 852
5100
Intel Itanium 2 1.5GHz
3370
0
2,250
4,500
6,750
9,000
SAP is a registered trademark of the SAP Corporation. Microsoft and Windows are registered trademarks of the Microsoft Corporation in the United States and other jurisdictions. For complete SAP benchmark information visit http://www50.sap.com/benchmarkdata/sd2tier.asp. These results are current as of March 3, 2006

Do Not Distribute

AMD Server Solutions Programs

Do Not Distribute

AMD Validated Server program overview

The program is designed to help solution providers compete more effectively by offering validated, stable and reliable barebones server solutions built on the AMD Opteron™ processor. AMD Validated Server platforms and platform providers offer industry leading service and support.

This innovative program has been designed to help you compete more effectively by offering:

- A high quality AMD Opteron™ processor-based server solution, featuring AMD64 architecture from carefully selected AMD Validated Server platform providers.
- Barebones configurations designed to make integration and configuration easy so that you can concentrate on what is most important; adding value for your customers.

Validated Server

Do Not Distribute

Comparison Between Server Programs

AMD Recommended Motherboards

Gives guidance to solution providers to help ensure the chosen solution is capable of meeting their needs. The program offers flexibility and freedom of choice. The boards in the program are offered from a wide variety of motherboard providers.

Thermally Tested AMD Platform

Confirms the platform used has been tested for thermal compliance to AMD standards. Saves time in trying to match solutions that may not perform optimally. As a barebones platform, it has been engineered and tested as a solution.

AMD Validated Server

The platforms in AMD Validated Server have been thoroughly tested in a variety of configurations and offer 3 Year longevity, 3 Year Warranty and 24/7 support through the platform provider. AMD Validated Server platforms are available through distribution.

Do Not Distribute

Informational Resources

Do Not Distribute

AMD Opteron™ Processor Informational Resources

- System Component Information
  Recommended Motherboards
  Thermal Solution Guidelines
  Thermally Tested Server Solutions
  Memory Guidelines
  Power Supply Guidelines
  Tower Chassis Guidelines
  www.amd.com/configuration

- Open Platform Management Architecture (OPMA) specification
  www.amd.com/opma

- Online Processor Quick Reference Guide
  www.amd.com/processorquickrefguide

- AMD64 Ecosystem
  http://www.amdcompare.com

- AMD Lead-Free Initiative
  www.amd.com/leadfree

- Pricing
  www.amd.com/pricing

- Model Numbers
  www.amd.com/modelnumbers

- Processor Diagram
  www.amd.com/architecutral-features

- Where to Buy
  http://shop.amd.com/us-en/platforms.aspx

- AMD Enterprise
  http://enterprise.amd.com/

- Customer Case Studies
  http://enterprise.amd.com/Multimedia/case_studies.aspx

Back-Up

Do Not Distribute

Server Market Adoption

HP ProLiant DL585

HP ProLiant DL385

HP ProLiant DL145 G2

HP ProLiant BL45p

HP ProLiant BL35p

HP ProLiant BL25p

LS20 for IBM eServer Blade Center

IBM eServer 326

Primergy BX630

Primergy RX220

Sun Fire V40z

Sun Fire X4200

Sun Grid Rack System

Sun Fire X2100

Sun Fire X4100

For additional product, and industry leading benchmark, information please visit:
www.amd.com/hp, www.amd.com/ibm, www.amd.com/sun & www.amd.com/fsc

Do Not Distribute

Blade Server Market Adoption

HP ProLiant BL35p

HP ProLiant BL45p

HP ProLiant BL25p

LS20 for IBM eServer Blade Center

Primergy BX630

For additional product, and industry leading benchmark, information please visit:
www.amd.com/hp, www.amd.com/ibm, & www.amd.com/sun

Do Not Distribute

Workstation Market Adoption

HP xw9300

FSC Celsius V830

IBM IntelliStation A Pro 6224

IBM IntelliStation A Pro 6217

Sun Java Workstation W1100z & W2100z

Sun Ultra 40 Workstation

For additional product, and industry leading benchmark, information please visit:
www.amd.com/hp, www.amd.com/ibm, www.amd.com/sun & www.amd.com/fsc

Do Not Distribute

AMD Server Solutions Programs

Do Not Distribute

AMD Server Channel Offerings

Best

AMD Validated Server

AMD's flag ship channel program. Features barebones platforms from select AMD Validated Server platform providers.

Better

Thermally Tested AMD Opteron Platforms

Offers barebones platforms based on AMD Recommended Motherboards that receive additional testing to confirm thermal compliance with AMD specifications.

Good

AMD Recommended Motherboards

Offers solution providers a wide range of Opteron motherboards that have been evaluated by AMD. An up to date listing can be found at http://www.amd.com

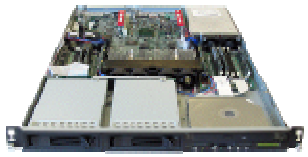
Do Not Distribute

AMD Validated Server Validation

- AMD Validated Server Validation includes:
  - Basic Platform Validation– CPU and memory subsystem centric testing and verification.
  - Thermal Testing (TMPE) – Confirmation of thermal compliance of the system.
  - Review of AMD Validated Server Partner testing and validation results.
- Validation is a collaborative effort between AMD and the partners.
  - Each of the platform providers are fully responsible for validating and testing their platforms.
  - AMD works with the platform provider during the validation process to confirm the quality and flexibility of the platforms in the program.
- All platforms labeled as AMD Validated Servers go through this rigorous process.
  - AMD Validated Server platforms have three year warranties provided by the platform providers.

Do Not Distribute

Comparison Between Server Programs



	AMD Recommended Motherboards	Thermally Tested AMD Platform	AMD Validated Server
Program Features	Features motherboards that have completed AMD's processor/memory complex testing. Confirms motherboard providers are following AMD's design guide and rules.	Features barebones server platforms that leverage an AMD Recommended motherboard in a thermally tested and approved chassis and sold as a barebones system through distribution.	Features barebones platforms that have been validated by AMD and select platform providers. The servers have been thoroughly tested and backed by 3 Year Warranties & industry leading service & support from the platform providers.
Program Benefits	Gives guidance to solution providers to help ensure the chosen solution is capable of meeting their needs. The program offers flexibility and freedom of choice. The boards in the program are offered from a wide variety of motherboard providers.	Confirms the platform used has been tested for thermal compliance to AMD standards. Saves time in trying to match solutions that may not perform optimally. As a barebones platform, it has been engineered and tested as a solution.	The platforms in AMD Validated Server have been thoroughly tested in a variety of configurations and offer 3 Year longevity, 3 Year Warranty and 24/7 support through the platform provider. AMD Validated Server platforms are available through distribution.

2006 AMD Validated Server Platforms

Platform	Tyan	Super Micro	Newisys	Uniwide
1U/1P Rack Server	GT20 B2865	1010S-T		
1U Pedestal Server	PX-22 B2865	4710S-T		
1U/2P Rack Server	GT24 B2891	1020P-TR	2100E 2110E	UW 1322
2P Pedestal Server	PX24 B2892	4020A-8R		
2P/2U Rack Server	TA26 B2882	2020A-8R	4300ED-P	UW 3326
4P/1U or 2U Rack Server	TX46 B4882	1040C		
4P/3U or 4U Rack Server			4300E	UW 3346
8 Way Server Platforms	Tyan VX-50			

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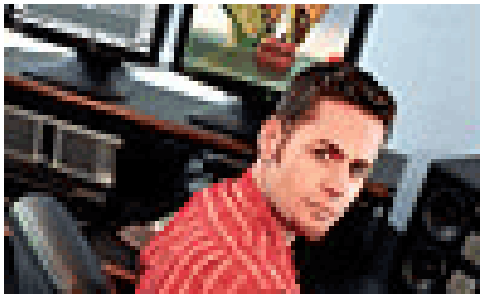
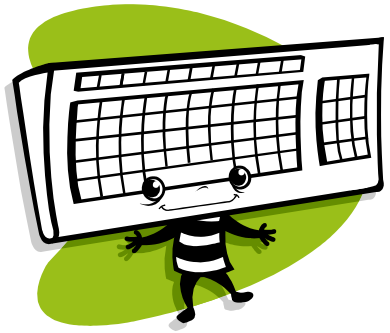
The Small Business Dilemma

Small business customers have basic server needs:

- Keep their **business up and running**
- Keep **employees productive and connected**
- Provide networking and connectivity services while remaining **easy to manage**



Unfortunately most hardware and software solutions are designed for either large businesses or consumers.



Lacking real solutions, small business customers have been forced to buy a DUD – **a dressed-up desktop** – to address their server requirements

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What's an AMD True Server Solution?

For more information visit
www.amd.com/trueservers

Hardware and software specification designed and tested with the **Small Business customers in mind**

- **True server processor** with server reliability and performance features, like the AMD Opteron™ processor 100 Series.
- **True server operating system** for small business, with server management and productivity features, like Microsoft® Windows® Small Business Server 2003.
- **True server motherboard** with server-focused features like the motherboards found at www.amd.com/configuration.
- **True server chassis** with security, management and reliability features to support your business.

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System Configurations

Do Not Distribute

SPECint_rate2000
2P Windows

- 2 AMD Opteron™ processors Model 285 with 2 x 1MB L2 cache in Tyan Thunder K8SD Pro (S2882D) motherboard, 2GB memory, 250GB SATA disk drive, Microsoft® Windows® Server 2003 Enterprise Edition SP1 http://www.spec.org/osg/cpu2000/results/res2006q1/cpu2000-20060220-05637.html
- 2 AMD Opteron processors Model 280 with 2 x 1MB L2 cache in Tyan Thunder K8QSD Pro (4882D) motherboard, 4GB memory, Microsoft Windows Server 2003 Enterprise Edition SP1 http://www.spec.org/cpu2000/results/res2005q4/cpu2000-20050919-04712.html
- 2 AMD Opteron processors Model 275 with 2 x 1MB L2 cache Acer Altos G5350 server, 8GB memory, 1 x 36GB SCSI hard disk, Microsoft Windows Server 2003 Standard Edition (Build 3790). http://www.spec.org/cpu2000/results/res2005q3/cpu2000-20050821-04520.html
- 2 AMD Opteron processors Model 270 with 2 x 1MB L2 cache in Tyan S2895 Thunder K8WE Motherboard, 4GB memory, 1 x 74GB SATA hard disk, Microsoft Windows Server 2003 Enterprise Edition SP1. http://www.spec.org/cpu2000/results/res2005q2/cpu2000-20050418-03984.html
- 2 Dual-Core Xeon 2.8GHz processors with 2MB L2 cache per core in IBM eServer xSeries 346, 8GB memory, 1x73GB SCSI hard drive, Microsoft Windows Server 2003, Standard Edition, SP1. http://www.spec.org/osg/cpu2000/results/res2005q4/cpu2000-20051006-04904.html
- 2 AMD Opteron processors Model 265 with 2 x 1MB L2 cache in Tyan S2895 Thunder K8WE Motherboard, 4GB memory, 1 x 74GB SATA hard disk, Microsoft Windows Server 2003 Enterprise Edition SP1. http://www.spec.org/cpu2000/results/res2005q2/cpu2000-20050418-03980.html
- 2 AMD Opteron Processors Model 254 with 1MB L2 cache in Tyan Thunder K8QSD Pro (4882D) motherboard, 4GB memory, 2 x 74GB SATA hard disk, Microsoft Windows Server 2003 Enterprise Edition SP1. http://www.spec.org/cpu2000/results/res2005q3/cpu2000-20050819-04513.html
- 2 Xeon 3.8GHz processors with 2MB L2 cache in HP Proliant DL380 G4 Server, Microsoft Windows 2003 Server, Standard Edition. http://www.spec.org/osg/cpu2000/results/res2005q3/cpu2000-20050902-04569.html
- 2 Xeon 3.6GHz processors with 2MB L2 cache in HP Proliant DL140 Server, Microsoft Windows 2003 Server, Standard Edition. http://www.spec.org/cpu2000/results/res2005q2/cpu2000-20050613-04275.html
- 2 AMD Opteron processors Model 252 with 1MB L2 cache in Tyan S2882 motherboard, Microsoft Windows Server 2003 Enterprise Edition. http://www.spec.org/cpu2000/results/res2005q1/cpu2000-20050207-03808.html
- 2 Xeon 3.2GHz processors with 2MB L2 cache in IBM eServer xSeries 236, 4GB memory, Microsoft Windows Server 2003 Standard Edition http://www.spec.org/cpu2000/results/res2005q3/cpu2000-20050624-04301.html

Do Not Distribute

SPECint_rate2000
2P Linux

- 2 AMD Opteron™ processors Model 285 with 2 x 1MB L2 cache in Tyan Thunder K8SD Pro (S2882D) motherboard, 2GB memory, 250GB SATA disk drive, SUSE Linux® Enterprise Server 9 SP3 forAMD64. http://www.spec.org/osg/cpu2000/results/res2006q1/cpu2000-20060220-05635.html
- 2 AMD Opteron processors Model 280 with 2 x 1MB L2 cache in FSC Celsius V830 Server, 4GB memory, SCSI U320 hard disk, SuSE Linux Enterprise Server 9 http://www.spec.org/osg/cpu2000/results/res2006q1/cpu2000-20060120-05410.html
- 2 AMD Opteron processors Model 275 with 2 x 1MB L2 cache in HP ProLiant BL45p, 16GB memory, 1 x 36GB SCSI hard disk, SuSE Linux Enterprise Server 9 (x86_64) SP1. http://www.spec.org/osg/cpu2000/results/res2005q2/cpu2000-20050502-04067.html
- 2 AMD Opteron processors Model 270 with 2 x 1MB L2 cache in Pogo Linux PerformanceWare 3566, 16GB memory, 1 x 74GB SCSI hard disk, SuSE Linux Enterprise Server 9 patch-9962 Release 20030321. http://www.spec.org/cpu2000/results/res2005q2/cpu2000-20050418-04000.html
- 2 AMD Opteron processors Model 265 with 2 x 1MB L2 cache in in Pogo Linux PerformanceWare 3566, SuSE Linux Enterprise Server 9 patch-9962 Release 20030321. http://www.spec.org/cpu2000/results/res2005q2/cpu2000-20050418-03996.html
- 2 AMD Opteron Processors Model 254 with 1MB L2 cache in Tyan Thunder K8QSD Pro (4882D), 4GB memory, 2 x 74GB SATA disk drive, SuSE Linux Enterprise Server 9 SP2. http://www.spec.org/cpu2000/results/res2005q3/cpu2000-20050819-04509.html
- 2 AMD Opteron processors Model 252 with 1MB L2 cache in HP BL25p Server, SuSE Linux Enterprise Server 9 for AMD64 SuSE kernel 2.6.5-7.97-smp. http://www.spec.org/cpu2000/results/res2005q1/cpu2000-20050124-03749.html
- 2 AMD Opteron processors Model 250 with 1MB L2 cache in HP ProLiant BL35p, SuSE Linux Enterprise Server 9 for AMD64 SuSE kernel 2.6.5-7.97-smp. http://www.spec.org/cpu2000/results/res2005q1/cpu2000-20050122-03723.html
- 2 Xeon 3.6GHz processors with 2MB L3 cache in ION Computer Systems LN20J, 2GB memory, 1x 80GB SATA hard disk, Red Hat Enterprise Linux 4 ES, 2.6.9-5.0.5.ELsmp EM64T. http://www.spec.org/cpu2000/results/res2005q3/cpu2000-20050711-04356.html
- 2 Xeon 3.4GHz processors with 1MB L2 cache in ION Computer Systems LN10J, SuSE Linux Professional 9.1, IA-32, 2.6.4-52-smp. http://www.spec.org/cpu2000/results/res2005q1/cpu2000-20050124-03747.html

Do Not Distribute

SPECfp_rate2000
2P Linux

- 2 AMD Opteron™ processors Model 285 with 2 x 1MB L2 cache in Tyan Thunder K8SD Pro (S2882D) motherboard, 2GB memory, 250GB SATA disk drive, SUSE Linux® Enterprise Server 9 SP3 forAMD64 http://www.spec.org/osg/cpu2000/results/res2006q1/cpu2000-20060220-05636.html
- 2 AMD Opteron processors Model 280 with 2 x 1MB L2 cache in Tyan Thunder K8QSD Pro motherboard, 4GB memory, 74GB SATA disk drive, SUSE Linux Enterprise Server 9 SP3 forAMD64 http://www.spec.org/osg/cpu2000/results/res2005q4/cpu2000-20050919-04709.html
- 2 AMD Opteron processors Model 275 with 2 x 1MB L2 cache in HP ProLiant BL25p, 16GB memory, 1 x 36GB SCSI hard disk, SuSE Linux Enterprise Server 9 (x86_64) SP1. http://www.spec.org/cpu2000/results/res2005q3/cpu2000-20050711-04362.html
- 2 AMD Opteron processors Model 270 with 2 x 1MB L2 cache in Pogo Linux PerformanceWare 3566, 16GB memory, 1 x 74GB SCSI hard disk, SuSE Linux Enterprise Server 9 patch-9962 Release 20030321. http://www.spec.org/cpu2000/results/res2005q2/cpu2000-20050418-03999.html
- 2 AMD Opteron processors Model 265 with 2 x 1MB L2 cache in Pogo Linux PerformanceWare 3566, 16GB memory, 1 x 74GB SCSI hard disk, SuSE Linux Enterprise Server 9 patch-9962 Release 20030321. http://www.spec.org/cpu2000/results/res2005q2/cpu2000-20050418-03995.html
- 2 Itanium 2 1.6GHz processors with 6MB L3 cache in HP Integrity rx2620-2, Red Hat Linux Advanced Server release 3.0AS (Update 3). http://www.spec.org/cpu2000/results/res2005q1/cpu2000-20041224-03675.html
- 2 AMD Opteron Processors Model 254 in Tyan Thunder K8QSD Pro (4882D) motherboard, 4GB memory, 2 x 74GB SATA disk drive, SuSE Linux Enterprise Server 9 SP2.http://www.spec.org/cpu2000/results/res2005q3/cpu2000-20050819-04508.html
- 2 AMD Opteron processors Model 252 with 1MB L2 cache in Fujitsu-Siemens CELSIUS V810, SuSE Linux 9.1 (AMD64), 2.6.4-52-smp. http://www.spec.org/cpu2000/results/res2005q1/cpu2000-20050221-03888.html
- 2 Dual-Core Xeon 2.8GHz processors with 2MB L2 cache per core in FSC Primergy RX300 S2 , 4GB memory, 1x36GB SCSI hard drive, 64-Bit Red Hat Enterprise Linux AS release 4 update 1. http://www.spec.org/osg/cpu2000/results/res2005q4/cpu2000-20051004-04899.html
- 2 Xeon 3.6GHz processors with 2MB L2 cache in Dell PowerEdge 1425SC, Red Hat Enterprise Linux 3 Update 2. http://www.spec.org/cpu2000/results/res2005q1/cpu2000-20050207-03822.html
- 2 Xeon 3.6GHz processors with 1MB L2 cache in IBM xSeries 336, SuSE Linux SLES 9 (64-bit), kernel 2.6.5-7.97-smp. http://www.spec.org/cpu2000/results/res2004q3/cpu2000-20040906-03386.html

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SPECfp_rate2000
4P Linux

- 4 AMD Opteron™ processors Model 885 with 2 x 1MB L2 cache in Tyan Thunder K8QSD Pro (S4882D) motherboard, 4GB memory, 250GB SATA disk drive, SUSE Linux® Enterprise Server 9 SP3 forAMD64 http://www.spec.org/osg/cpu2000/results/res2006q1/cpu2000-20060220-05640.html
- 4 AMD Opteron processors Model 880 with 2 x 1MB L2 cache in HP ProLiant DL585 Server, 32GB memory, 1 x 36GB SCSI hard disk, SuSE Linux Enterprise Server 9 (x86_64) SP1 http://www.spec.org/osg/cpu2000/results/res2005q3/cpu2000-20050902-04578.html
- 4 AMD Opteron processors Model 875 with 2 x 1MB L2 cache in HP ProLiant BL45p, 32GB memory, 1 x 36GB SCSI hard disk, SuSE Linux Enterprise Server 9 (x86_64) SP1. http://www.spec.org/osg/cpu2000/results/res2005q2/cpu2000-20050502-04066.html
- 4 AMD Opteron processors Model 870 with 2 x 1MB L2 cache in in Pogo Linux PerformanceWare 3566, 16GB memory, 1 x 74GB SCSI hard disk, SuSE Linux Enterprise Server 9 patch-9962 Release 20030321. http://www.spec.org/cpu2000/results/res2005q2/cpu2000-20050418-04001.html
- 4 AMD Opteron processors Model 865 with 2 x 1MB L2 cache in in Pogo Linux PerformanceWare 3566, 16GB memory, 1 x 74GB SCSI hard disk, SuSE Linux Enterprise Server 9 patch-9962 Release 20030321. http://www.spec.org/cpu2000/results/res2005q2/cpu2000-20050418-03997.html
- 4 Itanium 2 1.6GHz processors with 9MB L3 cache in SGI Altix 3700 Bx2, SGI ProPack™ v3.0 Service Pack 1. http://www.spec.org/cpu2000/results/res2004q4/cpu2000-20041101-03501.html
- 4 AMD Opteron Processors Model 854 in Tyan Thunder K8QSD Pro (4882D), 8GB memory, 2 x 74GB SATA hard disk, SuSE Linux Enterprise Server 9 SP2. http://www.spec.org/cpu2000/results/res2005q3/cpu2000-20050819-04510.html
- 4 AMD Opteron processors Model 852 in Sun Microsystems V40z server, SuSE Linux Enterprise Server 9. http://www.spec.org/cpu2000/results/res2005q1/cpu2000-20050211-03848.html
- 4 AMD Opteron processors Model 850 in Tyan Thunder K8QS Pro, SuSE Linux Enterprise Server 8 for AMD64 (SP3). http://www.spec.org/cpu2000/results/res2004q3/cpu2000-20040823-03372.html
- 4 Xeon MP 3.33GHz processors with 8MB L3 cache in Dell Power Edge 6800, 16GB memory, 1 x 18.2GB SCSI, Red Hat Enterprise Linux3 Update 2. http://www.spec.org/cpu2000/results/res2005q2/cpu2000-20050321-03940.html

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SPEC JBB2005

- 2 Dual Core AMD Opteron™ processors Model 285 with2 x 1MB L2 cache in Tyan Thunder K8SD Pro (S2882D) motherboard, 4GB memory, Sun's Java™ 2 Runtime Environment, Standard Edition (build 1.5.0_06_b05), Microsoft® Windows® Server 2003 Enterprise Edition SP1
  http://www.spec.org/jbb2005/results/res2006q1/jbb2005-20060228-00086.html
- 2 Dual Core AMD Opteron processors Model 280 with 2x 1MB L2 cache in Tyan S2895 Motherboard, 4GB memory, 1 x 40GB IDE hard drive, J2REIBM® 32-bit Runtime Environment for Windows®, Java™ 2 Technology Edition, Version 5.0 (build j9vmwi3223-20051017), Microsoft Windows Server 2003 Enterprise Edition.
  http://www.spec.org/jbb2005/results/res2005q4/jbb2005-20051025-00031.html
- 2 Dual-Core Intel Xeon 2.8Ghz (800MHz system, bus) with 2 x 2MB L2 cache per core in FSC Primergy RX300 S2, 4GB memory, 1 x 36GB SCSI disk drive, Sun Java HotSpot™ Server VM (build 1.5.0_06-b05), Microsoft Windows Server 2003 Enterprise Edition SP1.
  http://www.spec.org/jbb2005/results/res2005q4/jbb2005-20051206-00040.html

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MMB3
2P Servers

- 2 AMD Opteron™ processors Model 280 with 2x1MB L2 Cache in HP ProLiant DL385, 4 GB memory, Integrated HP Smart Array 6i controller, Dual Port Fibre Channel HBA (2Gb), Dual Port 1Gb NIC, Microsoft® Windows® Server 2003 Enterprise Edition, Microsoft Exchange Server 2003 SP1, with 20 clients. http://h71019.www7.hp.com/ActiveAnswers/cache/261683-0-0-0-121.html
- 2 AMD Opteron processors Model 275 with 2x1MB L2 Cache in HP ProLiant DL385, 4 GB memory, Integrated HP Smart Array 6i controller, Dual Port Fibre Channel HBA (2Gb), Dual Port 1Gb NIC, Microsoft Windows Server 2003 Enterprise Edition, Microsoft Exchange Server 2003 SP1, with 18 clients. http://h71019.www7.hp.com/ActiveAnswers/cache/261683-0-0-0-121.html
- 2 Dual-Core Xeon 2.8GHz processors with 2MB L2 cache per core in Dell PowerEdge 1850, 4GB memory, 1 Dell PERC4e/Di RAID controller, 1 Dell/EMC CX500 and CX300 SAN, 1 integrated Intel PRO/1000MT Gigabit adapter, Microsoft Windows 2003 Enterprise Edition, Microsoft Exchange Server 2003 (ver. 6.5.7226.0), with 17 clients. http://www.dell.com/downloads/global/solutions/MMB3-FDR-PE1850-2.8G-DualCore-CX500+CX300-9500-MMB3.pdf
- 2 Xeon 3.8GHz processors with 2MB L2 cache in IBM xSeries 346, 4GB RAM, 2 QLogic fibre channel adapter, Nextreme Gigabit. View PDF xSeries346
- 2 Xeon 3.6GHz processors with 2MB L2 cache in Fujitsu-Siemens PRIMERGY TX300S2, 4GB memory, 1 LSI Logic 1020/1030 U320 SCSI Adapter, 4 LSI Logic MegaRAID SCSI 320-4X RAID controllers, 1 LSI Logic MegaRAID SCSI 320-2X RAID controller, 1 Broadcom NetXtreme Gigabit Ethernet controller, Microsoft Windows Server 2003 Enterprise Edition, with 20 clients. View pdf
- 2 Xeon 3.6GHz processors with 1MB L2 cache in Fujitsu-Siemens PRIMERGY TX300S2, 4GB memory, 1 LSI Logic 1020/1030 U320 SCSI Adapter, 5 LSI Logic MegaRAID SCSI 320-4X RAID controllers, 1 Broadcom NetXtreme Gigabit Ethernet controller, Microsoft Windows Server 2003 Enterprise Edition, with 20 clients. View pdf

MMB3
4P Servers

- 4 AMD Opteron™ Model 880 with 2x1MB L2 cache in HP Proliant™ DL585 Server, 8GB memory, Integrated HP Smart Array 5i Plus controller, Microsoft® Windows® Server 2003 Enterprise Edition http://h71019.www7.hp.com/ActiveAnswers/cache/293287-0-0-0-121.html
- 4 Xeon MP 3.33GHz with 8MB L3 cache in Lenovo SureServer R650 G5, 4GB memory, 2 x QLogic QLA2340 PCI Fibre channel adapter, Microsoft Windows Server 2003 Enterprise Edition SP1 Learn More http://www.microsoft.com/exchange/evaluation/performance/default.mspx
- 4 Xeon MP 3.66GHz processors with 1MB L2 cache in IBM eServer xSeries 366, 4GB memory, Dell PERC4e/Di RAID controller, Dell/EMC CX700 and CX300 SAN, 1 Integrated Intel PRO/1000 MT Gigabit Ethernet controller, Microsoft® Windows® Server 2003 Enterprise Edition, with 18 clients Learn More (IBM x366 PDF) http://www.microsoft.com/exchange/evaluation/performance/default.mspx
- 4 AMD Opteron™ processors Model 852 with 1MB L2 Cache in HP ProLiant DL585, 4 GB memory, 5 HP Smart Array 6402 controllers, NC7782 Gigabit Ethernet adapter, Microsoft Windows Server 2003 Enterprise Edition, Microsoft Exchange Server 2003 SP1, with 22 clients. http://h71019.www7.hp.com/activeanswers/downloads/benchmark_exchange2003_dl585.pdf
- 4 AMD Opteron processors Model 850 with 1MB L2 Cache in HP ProLiant DL585, 4 GB memory, 5 HP Smart Array 6402 controllers, NC7782 Gigabit Ethernet adapter, Microsoft Windows Server 2003 Enterprise Edition, Microsoft Exchange Server 2003 SP1, with 10 clients. http://h71019.www7.hp.com/ActiveAnswers/downloads/DL5859Kperformancebrief.pdf

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SAP SD Benchmark
2P Processors

- 2 AMD Opteron™ processors Model 280 with 1MB L2 cache in IBM eServer BladeCenter Model LS20, 16GB memory, Microsoft® Windows® Server 2003, Enterprise Edition (64-bit), DB2 UDB 8.2.2 (64-bit). Certification 2006013.
- 2 Dual-Core Xeon 2.8GHz processors with 2MB L2 cache per core in HP ProLiant ML380 G4 Model SAS, 12GB memory, Microsoft Windows Server 2003, Enterprise Edition (64-bit), Microsoft SQL Server 2005 (64-bit). Certification 2006005.
- 2 Xeon 3.6GHz processors with 2MB L2 cache in HP ProLiant ML370 G4 Model HPS, 16GB memory, Microsoft Windows Server 2003, Enterprise Edition (64-bit), Microsoft SQL Server 2000 (32-bit). Certification: 2005008.
- 2 AMD Opteron processors Model 252 with 1MB L2 cache in IBM eServer 326, 16GB memory, Microsoft Windows Server 2003, Enterprise Edition (64-bit), IBM DB2 UDB 8.2.2 (64-bit). Certification: 2005029
- 2 Power5 1.65GHz with 1.92MB L2 cache, 18GB L3 cache in IBM eServer P5 Model 520, 16GB memory, AIX 5.3, IBM DB2 UDB 8.1. Certification: 2004061
- 2 Itanium2 1.5GHz with 6MB L3 cache in FSC Primergy Model RX1300, 12GB memory, Microsoft Windows Server 2003, Enterprise Edition (64-bit), Microsoft SQL Server 2000 (64-bit). Certification: 2004032
- 2 UltraSPARC IV 1.2GHz with 16MB L2 cache in Sun Fire E4900, 32GB memory, Solaris® 9, Oracle® 9i. Certification: 2004005

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SAP SD Benchmark
4P Processors

- 4 AMD Opteron™ processors Model 875 with 1MB L2 cache per core in HP Proliant™ DL585, 32GB memory, Microsoft® Windows® Server 2003, Enterprise Edition (64-bit), SQL Server 2000 (32-bit). Certification 2005017.
- 4 Dual-Core Xeon 3GHz processors with 2MB L2 cache per core in FSC Primergy™ Model RX800 S2, 32GB memory, Microsoft Windows Server 2003, Enterprise Edition (64-bit), Microsoft SQL Server 2005 (64-bit). Certification: 2006008
- 4 Power5 1.9GHz processors with 18MB L3 cache in IBM eServer P5 Model 570, 32GB memory, AIX 5.3, IBM DB2 UDB 8.1. Certification: 2004042
- 4 UltraSPARC IV 1.5GHz processors with 32MB L3 cache in Sun Fire Model V490, 32GB memory, Solaris 10, MaxDB 7.5. Certification: 2005042
- 4 Xeon MP 3.66GHz processors with 1MB L2 cache in IBM eServer xSeries 366, 32GB memory, Microsoft Windows Server 2003, Enterprise Edition (64-bit), IBM DB2 UDB 8.2 (64-bit). Certification: 2005016
- 4 AMD Opteron processors Model 852 with 1MB L2 cache in HP Proliant DL585, 16GB memory, Microsoft Windows Server 2003, Enterprise Edition (64-bit), Microsoft SQL Server 2000 (32-bit). Certification: 2005004
- 4 Itanium2 1.5GHz processors with 6MB L3 cache in HCL Infiniti Global Line Model GL 4800, 16GB memory, Microsoft Windows Server 2003, Enterprise Edition (64-bit), Microsoft SQL Server 2000. Certification: 2004078

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